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RESOLVING THE GENERA OF PSILODEROIDINAE IN AUSTRALIA (DIPTERA: MYTHICOMYIIDAE): LOST TYPES FOUND, MISIDENTIFICATIONS RECTIFIED, AND NEW GENERA DESCRIBED

NEAL L. EVENHUIS

BISHOP MUSEUM PRESS
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Cover: Images of four genera of Psiloderoidinae found in Australia (clockwise from top left): *Qaysug* Evenhuis, gen. nov., *Tolkunia* Evenhuis, gen. nov., *Zzyzzarro* Evenhuis, *Xymrod* Evenhuis, gen. nov. See page 38 for identifications and photo credits.

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Resolving the genera of Psiloderoidinae in Australia (Diptera: Mythicomyiidae): lost types found, misidentifications rectified, and new genera described[1]

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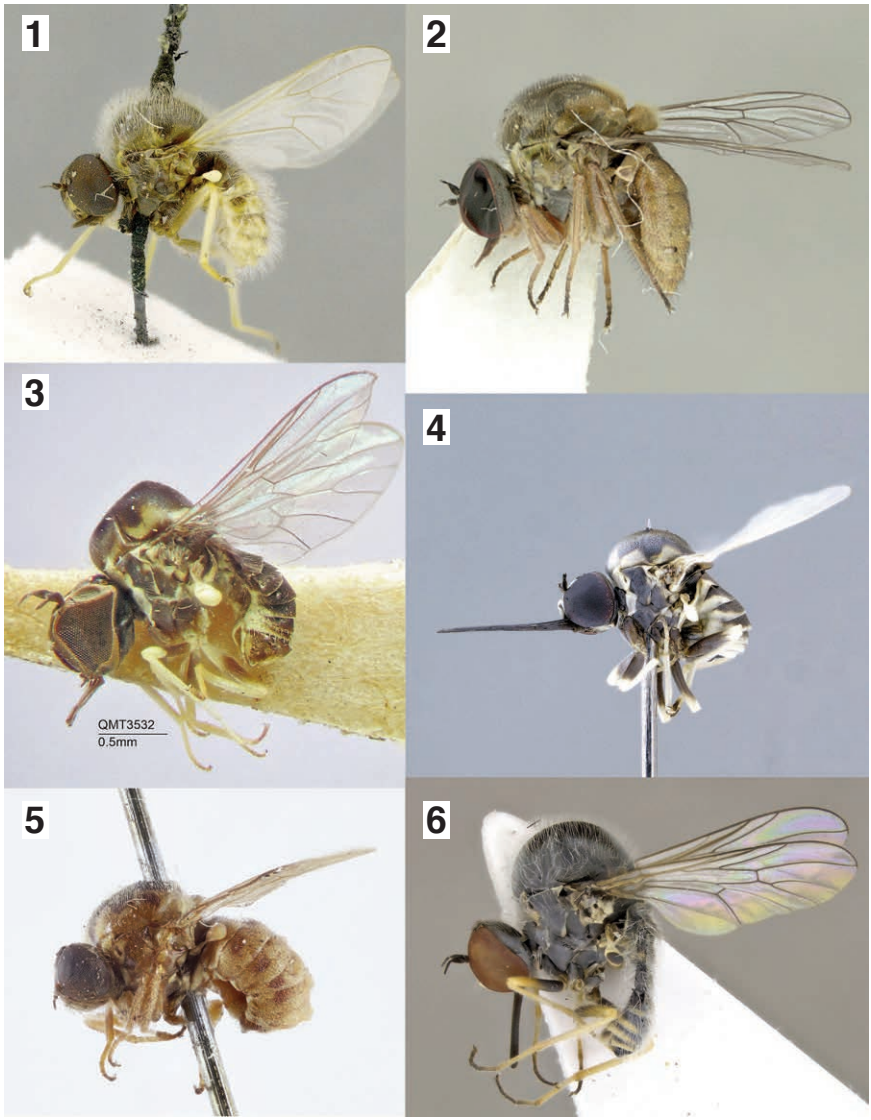
Abstract. Preliminary review of the Psiloderoidinae in Australia shows some species to have been misidentified in incorrect genera for over 100 years and others to have been misinterpreted based on incorrect assumptions of the types. The type of *Cyrtomorpha paganica*, thought to have been lost since it was last examined in 1947 was found; and living specimens of the species, not seen since last collected in 1919 were found again near the type locality exactly 100 years to the date of its last collection. In order to resolve the misidentifications, three new genera are described. The new genus *Xymrod*, **gen**. **nov**., comprises species that have been recorded as predators on the egg pods of the small plague grasshopper (*Austroicetes cruciata* de Saussure). It is shown that the new species *Xymrod pilosa* Evenhuis, **sp**. **nov**. is the species that was misidentified by Fuller in 1938 and subsequent authors as "*Cyrtomorpha flaviscutellaris*". The genus *Cyrtomorpha* White (= *Acridophagus* Evenhuis) is re-examined and characters given to separate it from its congeners in Australia, and the true *Cyrtomorpha flaviscutellaris* Roberts is redescribed and illustrated and shown to belong to the new genus, *Povno,* **gen**. **nov**. as *Povno flaviscutellaris* (Roberts), **comb. nov**., and one species is transferred from *Cyrtosia* to *Qaysug* Evenhuis, **gen**. **nov**.: *Qaysug parvissima* (Roberts), **comb**. **nov**. The first female of *Acridophagus paganicus* (White) is described and illustrated. Additionally, one further new genus, *Tolkunia* Evenhuis**, gen**. **nov**. is described (for *Tolkunia hibisci* Paramonov & Evenhuis, **sp. nov**.) since it is represented by a long series of specimens and its generic name has been listed in social media and in some specimen databases for some years now, so finally formally describing it seemed prudent. The results here are presented to correct previous misidentifications and solidify the generic concepts of the species to which the previously published species and misidentified records belong. The information presented here will be used in an ongoing revision of the subfamily in the Southern Hemisphere, which will include descriptions of other new genera and species. A key to genera to Australian psiloderoidine Mythicomyiidae is given.

INTRODUCTION

The family Mythicomyiidae, also known in common parlance as microbombyliids or micro bee flies, are fairly common in most parts of the arid and semi-arid areas of the globe with more than 450 species found worldwide (Evenhuis 2024b). It is somewhat surprising then that, until recent;y only four species were known from the vast continent of Australia. Many more actually exist, but due to their small size and most available specimens having been only recently collected, nothing had been published to increase that number. Evenhuis (2019) started the process in his revision of *Glabellula* Bezzi, describing two new species. Further papers are expected to add to this number. However, in the meantime, it was thought prudent to first provide a paper to help solidify proper identification of previously published names and set the stage for more revisions at the generic level or higher.

1. Contribution No. 2025-001 to the Pacific Biological Survey.



Figures 1–6. Australian Psiloderoidinae, habituses. **1**. *Acridophagus paganicus* (White), male; **2**. *Povno flaviscutellaris* (Roberts), female; **3**. *Qaysug parvissimus* (Roberts), male holotype. Photo: courtesy of Queensland Museum; **4**. *Tolkunia hibisci* Evenhuis & Paramonov, male, sp. nov.; **5**. *Xymrod pilosa* Evenhuis, sp. nov., female; **6**. *Zzyzzarro hortorum* Evenhuis, male.

Background

In reviewing the Tasmanian bee fly fauna, White (1916) described a new genus, *Cyrtomorpha,* collected in 1913 from dunes in Mangalore, near Hobart, the single male specimen of which he named *Cyrtomorpha paganica*. Thirteen years later, Roberts (1929) reviewed the Australian bee fly fauna and described an additional new species in *Cyrtomorpha: C. flaviscutellaris*, from Western Australia; and one new species in *Cyrtosia* Perris: *C. parvissima* from Queensland. Since Roberts's (1929) work, nothing much new taxonomically has been published on the flies of Psiloderoidinae in Australia. Two further mythicomyiid genera in two other subfamilies have been recorded from Australia: *Empididеicus* Becker (Empididеicinae) (one undescribed species known, Evenhuis 1989) and *Glabellula* Bezzi (Glabellulinae) (reviewed in Evenhuis 2019).

In this study, the genus *Acridophagus* Evenhuis (formerly *Cyrtomorpha* White, preocc.) is redescribed based on the finding of its type species 100 years after it was last collected, the new genera *Povno* **gen. nov**. and *Xymrod* **gen. nov**., are described to resolve misidentifications in the literature; and the new genus *Tolkunia* **gen. nov**., from Western Australia, is described and augmented with photos from life. *Cyrtosia parvissima* Roberts is transferred to the new genus *Qaysug* **gen. nov**. and a key to the genera of psiloderoidine Australian Mythicomyiidae is presented to help distinguish the taxa known thus far.

A Misidentification Perpetuated

When Fuller (1938a, b) wrote her papers on the predators associated with the small plague grasshopper (*Austroicetes cruciata* de Saussure), she identified flies that were bred from the egg pods of that grasshopper as *Cyrtomorpha flaviscutellaris* Roberts. Aside from name changes to the nominal genus because it is preoccupied, the species name *flaviscutellaris* has persisted in the literature as a grasshopper predator. However, examination in this study of the type of *Cyrtomorpha flaviscutellaris,* and of the specimens Fuller (1938b) saw, show that the two respective species each belong to two different genera, both new, which are described in this paper. Comparing the type of *Cyrtomorpha flaviscutellaris* with the description of *Cyrtomorpha* White (now *Acridophagus* Evenhuis) in this study shows that *flaviscutellaris* belongs in a new genus, proposed here as *Povno*, **gen. nov**. The specimens Fuller (1938b) saw, which she misidentified, belong to a new species in the genus *Xymrod* **gen. nov**. described below.

MATERIAL AND METHODS

Specimens were borrowed from, examined in, or are deposited in the following institutions and collections: The Australian Museum, Sydney (AMS); Australian National Insect Collection, Canberra (ANIC); Bishop Museum, Honolulu (BPBM); the Natural History Museum, London (BMNH); National Museum of Victoria, Melbourne (NMVM); Queensland Museum, South Brisbane (QM); South Australian Museum, Adelaide (SAM); Tasmanian Museum and Art Gallery, Hobart (TMAG); National Museum of Natural History, Washington, D.C. (USNM); Western Australia Department of Agriculture, Perth (WADA); and the Western Australian Museum, Perth (WAMP). Museum abbreviations follow Evenhuis (2024a).

Genitalic preparations were made by macerating parts in either hot lactic acid (30 seconds once or twice in a microwave) or overnight in an enzymatic solution used for cleaning contact lenses (see Yau & Marshall, 2015), washing in distilled water, and dis-

secting and examining in concave slides in a medium of glycerine or Purell® hand sanitizer mixed with a drop of 95% ethanol; male genitalia are preserved in microvials pinned below the specimen; female genitalia are mounted on slides or preserved in glycerine vials along with the dissected specimen. Images of various morphological structures were accomplished by using a Leica M165C stereo dissecting scope with a DMC5400 camera and a Leica DM2500 compound scope with a MC 170 HC camera via the Leica Microsystems LASX Multifocus software (v. 5.0.1) and using Zerene Stacker® software (v. 1.04) (Zerene Systems, LLC, Richmond, Washington, USA) to align and stack-focus each final image. Adobe Photoshop 2024 (version 25.12) was used to increase saturation and contrast of colors in the Wing Interference Pattern images to make them more visible.

In keeping with the derivation of the family name Mythicomyiidae [= mythical flies], some of the new genus-group names proposed here are of fantasy creatures derived from the Fantasy Dragon Name Generator at: https://www.fantasynamegenerators.com/dragon-names.php. Etymologies explain the derivation of each new genus-group and species-group name proposed.

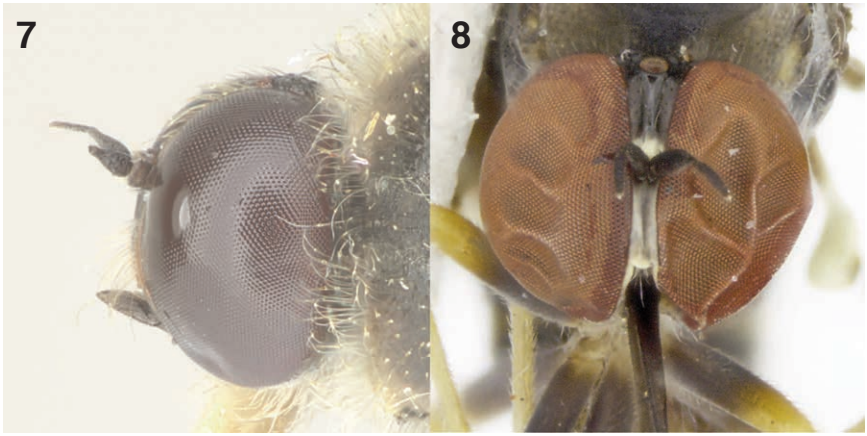
Morphological terminology follows Cumming & Wood (2017).

TAXONOMY

The Australian mythicomyiid fauna were first studied by Arthur White (1916) who described the first mythicomyiid, *Cyrtomorpha paganica* White, from Tasmanian dunes, based on a single specimen. Hardy (1921) added three further specimens to that species collected in the same general area, but added no new species. Malloch (1924) described a new species (*australis*) in the genus *Pachyneres* Greene (currently a junior synonym of *Glabellula* Bezzi). Roberts (1929) in his review of the Australian Bombyliidae, described a further two new species and placed one in *Cyrtomorpha* (*C. flaviscutellaris*) and one in *Cyrtosia* Perris (*C. parvissima*). As shown below, the microbombyliid genus *Cyrtosia* does not occur in Australia[2]. Australian specimens identified as such in the literature and in collections, belong in part to new genera described herein or to be described elsewhere in a more detailed review. [NB: *Cyrtosia* is easily separated from Australian Psiloderoidinae by the incomplete vein Sc, effaced distally and not reaching the costa (cf. Fig. 11) (this vein complete and reaching the costa in Psiloderoidinae).]

A not well-studied but diverse microbombyliid fauna in Australia has apparently resulted in many misidentifications since Roberts (1929), most of which have persisted in the literature by virtue of adopting the names used in previous works without examination of type material. Examination of types in this study clarifies the true status of the genera and species previously described from Australia and examination of various collections shows a fairly diverse fauna with many new taxa awaiting description. The late Sergei Paramonov had made notes on some of the taxa studied here when he first arrived in Australia or a few years before when he visited the British Museum (Natural History) in London. His assistant at the time, Zenta Liepa, transcribed and translated some of those notes into English and were made available to me by her for my study many years ago These notes have proven invaluable as Paramonov saw types at a time when they were in better condition that they currently are, and some of the notes he made have been used to compare with those types and to compare with other taxa I have studied in this review.

2. Interestingly, the the orchid genus *Cyrtosia* does occur in Australia.



Figures 7–8. Psiloderoidinae heads. **7**. *Acridophagus paganicus* (White), male, lateral view; **8**. *Zzyzzarro hortorum* Evenhuis, male, frontal view.

Key to subfamilies of Mythicomyiidae in Australia

1. Wing with vein R_{2+3} present **2**
–. Wing with vein R_{2+3} absent ..... Empididei cinae ... (*Empididei cus*)

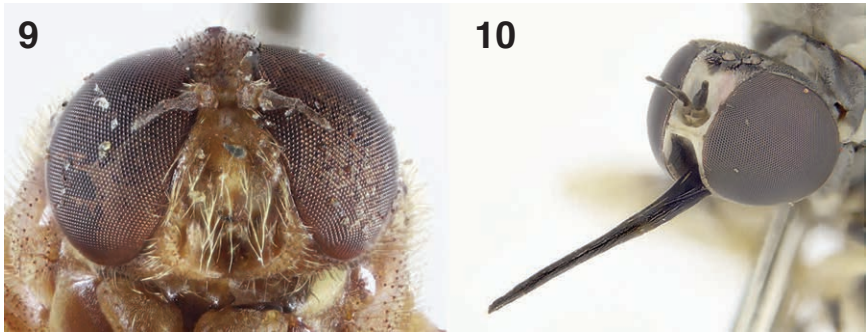
2. Wing with vein Sc incomplete (Fig. 13), not reaching costa; vein R_{2+3} ending in R_1 forming small triangular cell; cell bm and dm fused; tergite I with sclerotization interrupted medially ..... Glabellulinae ... (*Glabellula*)
–. Wing with Sc complete (e.g., Fig. 16), reaching costa; vein R_{2+3} ending in costa beyond end of R_1 ; cell bm and dm not fused; sclerotization of abdominal tergite I complete, not interrupted medially (some specimens of *Xymrod*, gen. nov., have tergite I deeply incised medially, but not divided in two as in Glabellulinae) ..... Psiloderoidinae

Key to Genera of Psiloderoidine Mythicomyiidae of Australia

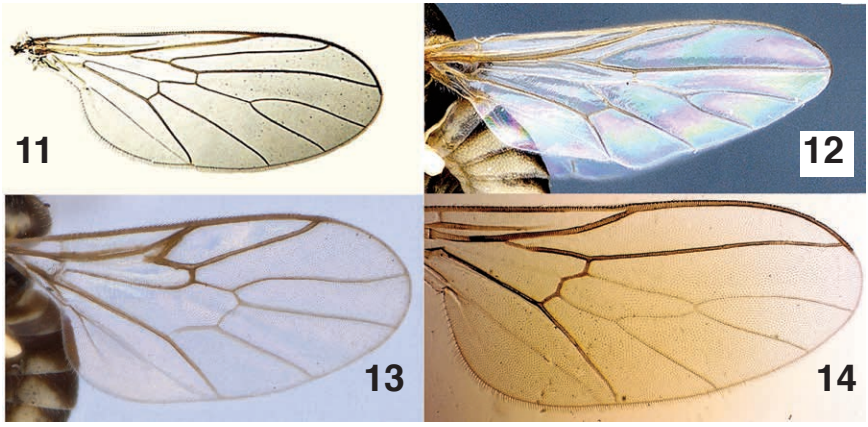
1. Mouthparts extremely reduced or vestigial, not exceeding oral margin (Fig. 9); generally large, plump looking flies, abdomen much wider than thorax (Fig. 56)..... ***Xymrod*** Evenhuis, **gen. nov**.
–. Mouthparts normal, extending beyond the oral margin or as long as oral margin (e.g., Fig. 10); much smaller, thinner flies; abdomen as wide or wider than thorax, but if wider, not to the extreme as above (e.g., Fig. 66) **2**

2. Crossvein r-m beyond middle of discal cell (Fig. 15); cell br longer than cell bm **3**
–. Crossvein r-m at or before middle of discal cell (Fig. 16); cell br subequal in length to cell bm **4**

3. Face narrow, not widened apically; with small protruding tip (Fig. 8), proboscis long, longer than head height; indentation on inner eye margin long, ca, length of 7–8 ommatidia (Fig. 8); male genitalia not rotated 90° ..... ***Zzyzzarro*** Evenhuis



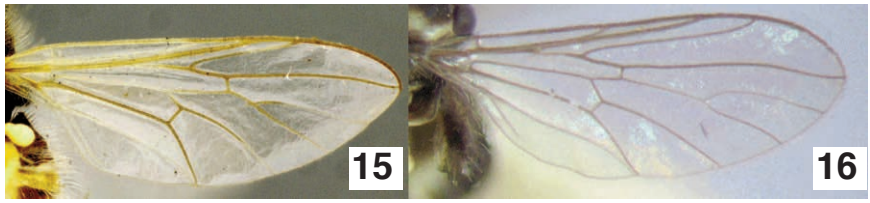
Figures 9–10. Psiloderoidinae mouthparts. **9**. *Xymrod pilosa* Evenhuis, sp. nov.; **10**. *Tolkunia hibisci* Paramonov & Evenhuis, sp. nov.



Figures 11–14. Mythicomyiidae wings. **11**. *Cyrtosia persica* Gharali & Evenhuis; **12**. *Tolkunia* sp.; **13**. *Glabellula australis* (Malloch); **14**. *Empidideicus* (*Anomaloptilus*) *cnecotoichus* Evenhuis.

–. Face broader than above, widened and receding apically, without small protruding tip in lateral view; proboscis barely extends beyond oral margin (Fig. 7); indentation of inner eye margin very short, ca. length of 2–3 ommatidia (Fig. 22); male genitalia rotated 90° ..... ***Acridophagus*** Evenhuis

4. Incision on inner eye margin at level of antennal sockets; Wing Interference Pattern with clearly delineated band along posterior margin (Fig. 36); scutellum with sparsely distributed short erect hairs on middle of disc; males with thorax often extremely humpbacked in appearance in lateral view (Fig. 3) ..... ***Qaysug*** Evenhuis, **gen. nov**.



Figures 15–16. Psiloderoidinae wings. **15**. *Acridophagus paganicus* (White), male; **16**. *Qaysug parvissimus* (Roberts).

–. Incision on inner eye margin above level of antennal sockets (Fig. 31); Wing Interference Pattern without (rarely with) clearly delineated band along posterior margin of wing (e.g., Fig. 45) **5**

5. Face much shorter than frons (Fig. 10); proboscis long, tubular, pointed apically (Fig. 10) ..... ***Tolkunia*** Evenhuis, **gen. nov**.

–. Face as long as frons (Fig. 31); proboscis long or short, not pointed apically .... ***Povno*** Evenhuis, **gen. nov**.

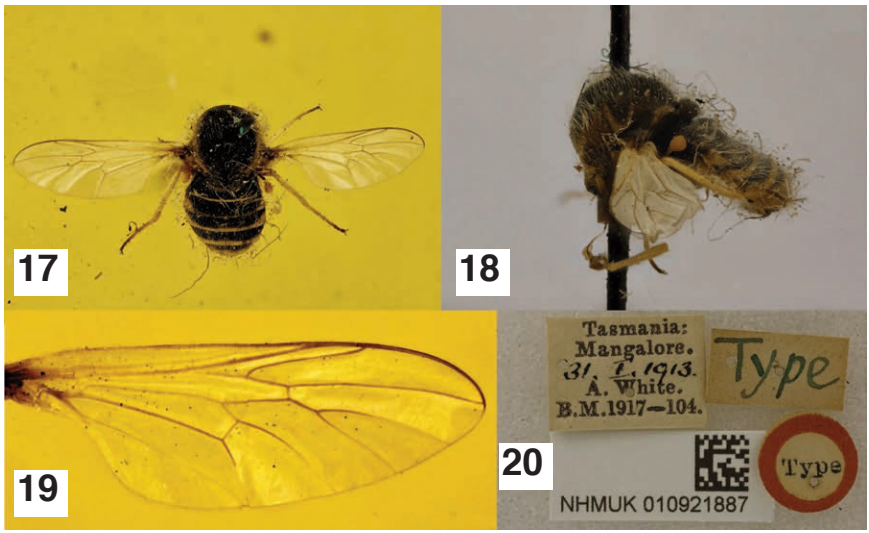
Acridophagus Evenhuis

Cyrtomorpha White, 1916: 185. Hardy, 1921: 64, 1922: 146; Bezzi, 1924: 7. Malloch, 1927: 140. Roberts, 1928: 91; 1929: 566. Brues & Melander 1932: 296. Paramonov, 1939: 33. Melander, 1946: 455. Andersson, 1974: 29. Hall, 1976: 6. Evenhuis, 1983a: 400; 1983b: 318; 1991: 32; 2002a: 17, 2024b: 19. Greathead & Evenhuis, 2001: 129. [Preoccupied by Graff, 1882.] Type species: *Cyrtomorpha paganica* White, 1916, by monotypy.

Robertsella Evenhuis, 1978: 247 (new replacement name for *Cyrtomorpha* White, 1916). Evenhuis, 1983a: 420; 1983b: 318; 1991: 66; 2002a: 17; 2024b: 19. Daniels, 2004: 364. [Preoccupied by Guinot, 1969.] Type species: *Cyrtomorpha paganica* White, 1916, automatic.

Acridophagus Evenhuis, 1983b: 318 (new replacement name for *Robertsella* Evenhuis, 1978). Evenhuis, 1989: 360; 1991: 8, 15; 2002a: 17; 2024b: 19. Evenhuis & Greathead, 1999: 554. Greathead & Evenhuis, 2001: 129. Daniels 2004: 365. Lamas *et al*. 2015: 403. Myskowiak *et al*., 2016: 583. Cranston, 2019: 50. Type species: *Cyrtomorpha paganica* White, 1916, automatic.

Diagnosis: Distinguished from other members of the family in Australia by the combination of a long hirsute mesonotum and short proboscis extending only slightly beyond oral margin. In both sexes the head is higher than wide in lateral view (Fig. 7) and placed low on the thorax, giving the thorax a rather humpbacked appearance. The postgena, anterior thorax, and hind femora are all densely clothed with hairs. The antenna has the second flagellomere almost the same length as the first. The oral opening is comparatively large and extending posteriorly to the mentum. The wing is broad, length ca. two times greatest width and has vein R_{2+3} originating at roughly the halfway point of Rs and running parallel to R_1, ending in the wing margin at approximately 1/3 the distance from R_1 to R_{4+5}; the r-m crossvein is placed beyond the middle of M_{1+2}; and the anal cell is open in the wing margin.

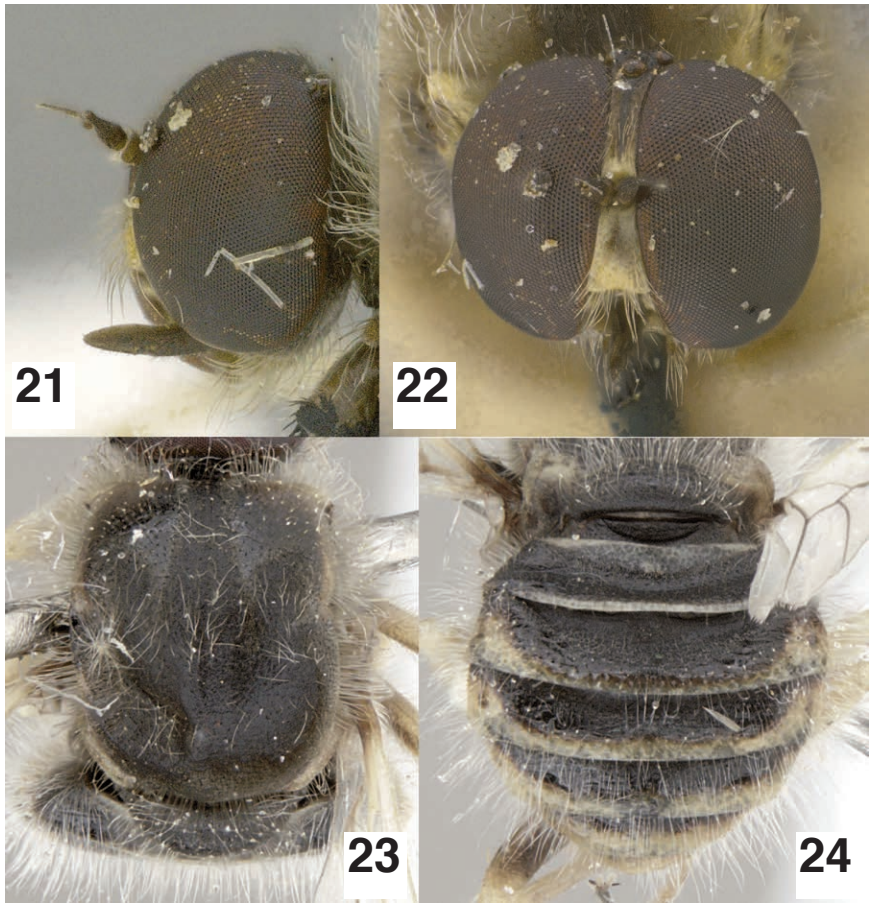


Figures 17–20. *Acridophagus paganicus* (White), holotype in BMNH. **17**. Dorsal habitus; **18**. Lateral habitus (head broken off); **19**. Wing; **20**. Labels. Photos: Xuankun Li.

Remarks: *Acridophagus* is a rare genus that is represented in collections by only a handful of specimens (almost all males; the first female only recently collected in northern Tasmania). The type species was, until recently, thought to possibly be extinct since specimens had not been collected since 1918, although collections including concentrated Malaise trapping regimes have been made in and around the type locality surrounding Hobart. A recent finding of a specimen in Hobart, almost exactly 100 years to the day since it was last seen gave hope that the species exists but may be in extremely reduced populations. The next year, two additional specimens were collected in northern Tasmania including the first female, examination of which shows that there is, as was suspected, sexual dimorphism as there is in *Xymrod*, n. gen., a known predator of grasshopper egg pods. The northern Tasmanian specimens were collected in association with an outbreak of grasshoppers. The wing venation is also similar to *Xymrod* with distal placement of the r-m crossvein (*Xymrod* is the only other Australian mythicomyiid with that character) so that, despite the mouthpart differences, the two genera may be closely related and may also thus share the same immature host preference. Further surveys and research into the biologies of grasshopper egg pod predators may hopefully bear this out.

Distribution: Australia (Tasmania).

Included species: *Acridophagus paganicus* (White).

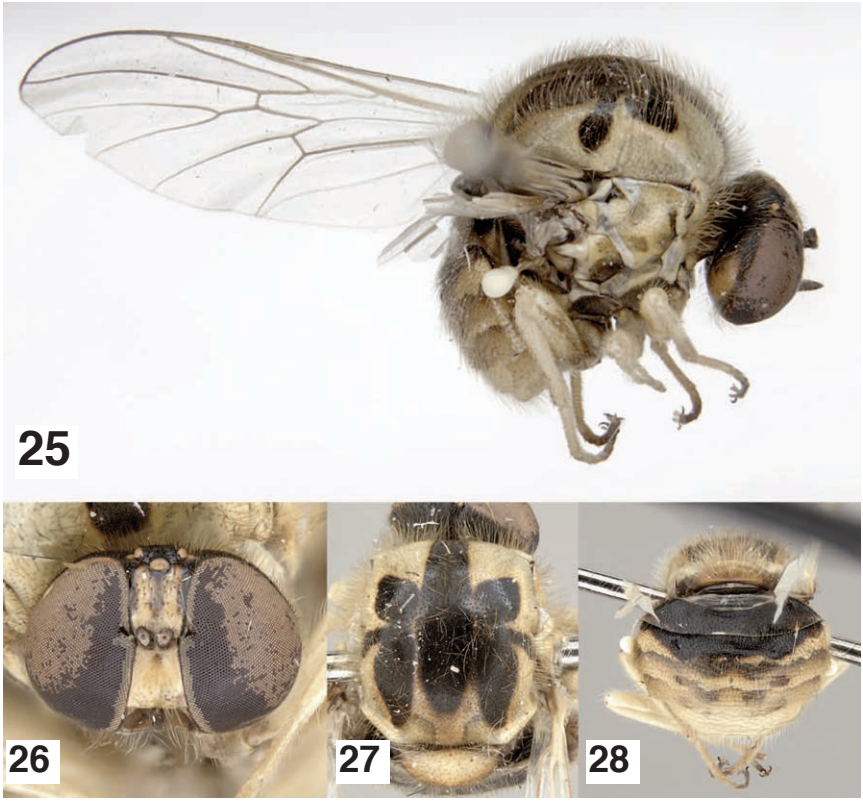


Figures 21–24. *Acridophagus paganicus* (White), male. **21**. Head, lateral; **22**. Head, frontal; **23**. Thorax, dorsal; **24**. Abdomen, dorsal.

Acridophagus paganicus **(White)**
(Figs. 1, 7, 15, 17–28, 66–67)

Cyrtomorpha paganica White, 1916: 185. Hardy, 1921: 65. Bezzi, 1924: 7. Roberts, 1929: 566. Hull, 1973: 261. Andersson, 1974: 29. Hall, 1976: 6. Daniels, 2004: 1275.
Robertsella paganica (White). Evenhuis, 1978: 247. Evenhuis, 1983a: 483.
Acridophagus paganicus (White). Evenhuis, 1983b: 318; 1989: 360; 2002a: 17; 2024b: 19. Cranston, 2019: 50. Baker *et al*., 2021: 74. Grove *et al*., 2021: 80.

Type. Holotype ♂ (Figs. 17–20) from AUSTRALIA: **Tasmania**: Mangalore [near Hobart], 31 January 1913, Arthur White (collected in flight). Paramonov examined the type in 1947 and made notes on it (see below). The three specimens collected in January 1918 from Bellerive, Tasmania by G.H. Hardy were not found during this study, despite numerous inquiries.



Figures 25-28. *Acridophagus paganicus* (White), female. **25**. Habitus, lateral; **26**. Head, frontal; **27**. Thorax, dorsal; **28**. Abdomen dorsal.

While studying bombyliid types in London in 1947, S.J. Paramonov made notes on the type of *Cyrtomorpha paganica*. His unpublished note states:

> "Type. A small species, *Empidideicus*-like hairs of the thorax and abdomen rather dense, yellowish, erect, which is very specific. Legs and halteres yellow. Antennae brown-black. Venation very typical: discal cell absent, 4 posterior cells, the first and fourth nearly normal, but the second cell is tapering at the base, forming an angle; from the apex of this angle runs a small vein towards the base of wing, separating the first posterior cell from the third one; in other words, the vein m1 is bifurcated; third longitudinal vein is simple, not bifurcated, nearly straight. Costa reaches only the apex of the third longitudinal vein, but the hind margin of wing is further free, without vein. Upper basal cell much longer than the lower one. Anal cell narrowly open. Axillary cell much broader than anal cell. Second longitudinal vein is short, straight, distinct. First longitudinal vein also strong and straight, but slightly yellowish. Mediastinal vein very poorly developed, there is only a trace of it.

Hind margin of eyes without excavation. Third antennal joint elongated, onion-shaped, with a stick-like style which is as long as the joint itself. Frontal stripe narrow, a little narrower than ocellar tubercle. Proboscis short, but protruding from the mouth cavity. Hind margin of tergites narrow, yellow, towards the apex of the abdomen broadening on each tergite. Legs without bristles, only poorly haired. Pulvilli distinct."

Other material examined: AUSTRALIA: **Tasmania**: 1♂, Hobart, 29 Jan 1918, C.E. Cole (NMVM); 1♂, Musselroe, Xanthorrhea Ridge, N. end, 40.7988°S, 148.0917°E, 16 Jan 2019, hand collected, F97692, S.J. Grove (TMAG); 1♀, Musselroe: Heathlands WNW Turbine D08, 40.7909°S, 148.0893°E, 16 Jan 2019, hand collected, F97644, S.J. Grove (TMAG).

Description

Male (Fig. 1). Lengths: body: 4.0 mm; wing: 3.5 mm. *Head*. Black; eyes dichoptic, separated at vertex by more than distance between lateral ocelli, narrowing to 1.5× width of lateral ocelli at level of antennae; vertex and occiput black, occiput with white decumbent hairs, longest on ventral half; frons with narrow groove medially, black medially to just above antennal bases, brown on inner eye margins, yellowish white just above bases of antennal bases, line of brownish hairs along inner eye margin to just above antennal bases; face receding, yellowish, length shorter than frons, with long, yellowish white hairs; antenna (Fig. 21) black; scape and pedicel subcylindrical, slightly wider than long; first flagellomere subconical, slightly flared apically, length about 2× greatest width; second flagellomere long, cylindrical, about 4/5 length of first flagellomere, with small apical style; postgena black, becoming yellowish brown at posterior margin of oral cavity; proboscis brown, pointed apically, length slightly longer than oral margin; labellum about 1/3 length of proboscis; palpus not evident.

Thorax. Mesonotum and scutellum (Fig. 23) matte black, with dense, long white hairs; humeral callus, large interhumeral triangle, broad notopleural line to wing base, post alar callus, proepimeron, and metakatepisternum yellow; halter stem yellow, knob white.

Legs. Predominantly yellow, with femora slightly brown basally; tibiae and tarsal segments I–III yellow, tarsal segments IV–V brown. Coxae with short yellowish hairs distally; femora with dense, long white hairs; tibiae with shorter yellowish white hairs. Pulvilli ovoid, subequal in length to claws.

Wing (Fig. 15). Hyaline; veins yellow; costa ends slightly beyond end of R_{4+5}; vein Sc ending in wing margin at level of origin of vein R_{2+3}; R_{2+3} shorter than R_{4+5}, originating at midway point of Rs, ending in wing margin at level midway along R_{4+5}; Rs evanescent at connection with R_1; R_{4+5} slightly sinuous at wing margin; r-m crossvein placed at 2/3 of vein M_{1+2}; vein M_1 curved toward wing margin; M_2 fairly straight to wing margin; crossvein dm-cu closing cell dm absent; anal cell almost closed at wing margin; CuP slightly curved apically; A_1 incomplete, ending in middle of anal lobe; anal lobe normal; alula reduced; fringe of short hairs on posterior margin of wing.

Abdomen. Dorsum predominantly shining brownish black, with scattered long white hairs, densest laterally; yellow color laterally on tergites I–VII, extending medially as posterior fasciae on all segments, becoming broader on each successive tergite going posteriorly; venter brown medially, with yellowish color on lateral and posterior portions of all segments.

Genitalia. Not dissected. Gonocoxites and epandrium yellow; pseudosurstyli of epandrium dark brown, pointed.

Female (Fig. 25). Exhibiting dimorphism and different from the male as follows: in general body appearance, the abdomen (Fig. 28) is broader than the thorax, ovate in shape; and the body has more distinct yellow patterning; eyes distinctly dichoptic, separated at vertex by 2× width of ocellar tubercle; scutellum all yellow; mesonotum (Fig. 27) yellow with pattern of three coalesced black vittae dorsally. Genitalia not dissected.

Remarks. Until recently, only five specimens (all males) of this species have ever been collected. White's single male type was last seen by Paramonov in 1947 in the BMNH. The type was searched for by me and BMNH staff on many occasions over the last 30 years without luck and was thought to be lost. However, during a visit in October 2018 by Xuankun Li examining types of bombyliines from Australia in the BMNH, the type was found misplaced in the collection and sitting next to the holotype of *Bombylius chrysendetus* White (the latter of which is now in *Staurostichus*). The holotype of *Cyrtomorpha paganica* is depicted in Figs. 17–19 via images taken through the courtesy of Xuankun Li. Its head has, since Paramonov's examination, been broken off and is stored in a gelatin capsule pinned below the type.

The three specimens reported by Roberts (1929) deriving from G.H. Hardy have not been located and are presumed to have been lost or destroyed (as also recorded as such in Paramonov's notes made presumably in the 1950s or 1960s).

Hardy (1921) gave the following details of his collection of three non-type males: "Tasmania, Bellerive, near Hobart. Three specimens were collected on a costal sand-dune on the 25th January, 1918; they were hovering over and settling on bare spaces amongst foliage, but owing to their small size they were extremely difficult to see even when settled on the bare patches."

On 25 January 2018, 100 years after the last specimens of this species had been seen, a male specimen was photographed by Nathan Butterworth as it rested in the ground (Fig. 66). A notice of the finding was soon posted on social media to alert others in Tasmania to be on the lookout for this rare and elusive fly. The following year, two specimens (a male and the first known female) were found, not in the original Hobart area, but instead some 350 km away in Musselroe Bay in northern Tasmania. The two specimens were collected during an emergence of grasshoppers (S. Grove, pers. comm.) which, given the similarity in appearance to specimens of *Xymrod*, gen. nov. (a known grasshopper egg pod predator), may be indicative of a similar close association with grasshoppers that needs further investigation to ascertain whether or not they are grasshopper egg predators. The first photograph of a live female was published by Grove *et al*. (2021).

Variation. Some variation is shown in the dark basal coloration of the male. the holotype was described by both White and Paramonov as having the legs all yellow (the photographs of the holotype unfortunately do not show the bases of the femora so this could not be verified). The specimen from Hobart in NMVM has the basal portion of the femora orangish in color, which could be construed as just a darker shade of yellow if not having seen other specimens with darker coloration). The photograph of the male seen in 2018 in Hobart has some dark brown on the bases of femora, as does the male collected in northern Tasmania, but the latter more extensive. All other characters shown in the males examined physically or in photographs appear the same, thus I believe them all to be the same species.

Distribution. Australia (Tasmania).

***Povno* Evenhuis, gen. nov.**

New genus C. Evenhuis, 2022: 2.

Type species: *Cyrtomorpha flaviscutellaris* Roberts, 1929, by present designation.

Diagnosis: Easily separated from *Xymrod*, and *Acridophagus* by the combination of short proboscis (extending only slightly beyond the oral margin) and crossvein r-m at the basal 1/3 of cell dm making cell br subequal in length to cell bm. The description below can serve as the description of the genus until other species are found.

Distribution: Australia (Western Australia).

Etymology. A fantasy dragon name, whose full name is Povno, the Fierce. The name is treated as masculine.

Included species: *Povno flaviscutellaris* (Roberts, 1929), **comb. nov.**

***Povno flaviscutellaris* (Roberts), comb. nov.**
(Figs. 2, 29–33, 68)

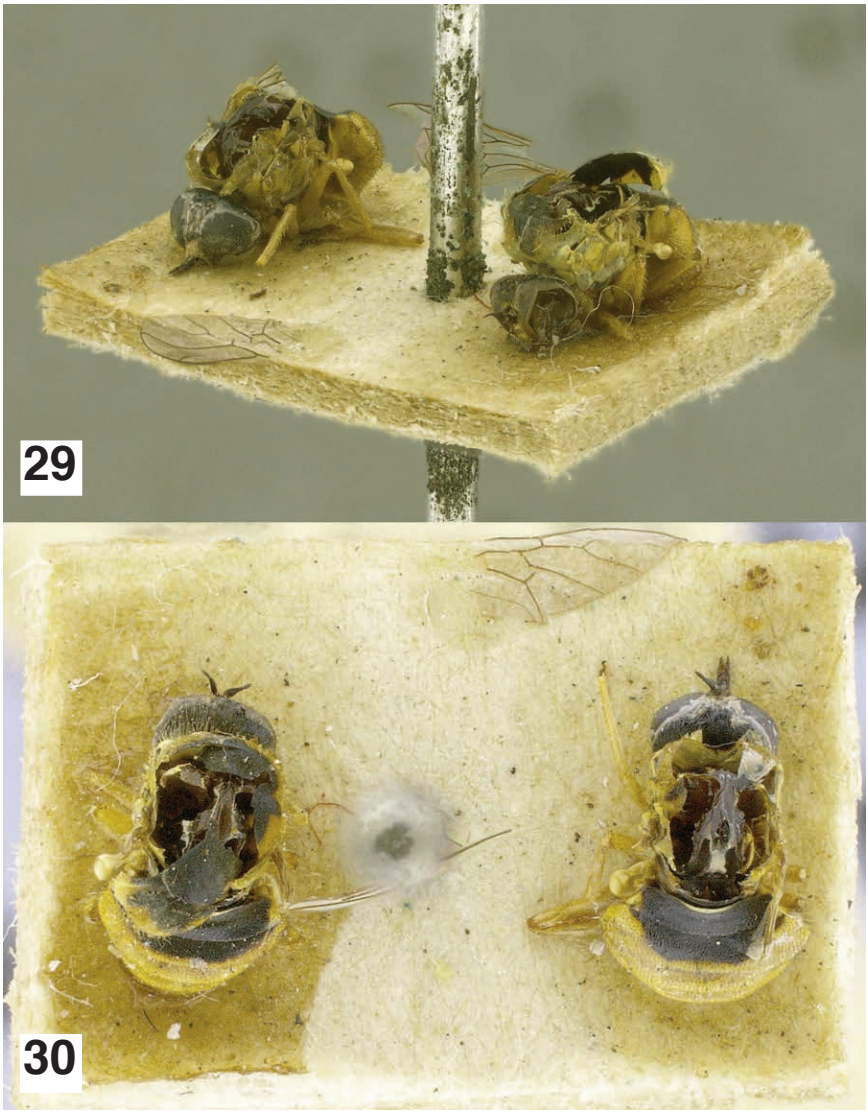
Cyrtomorpha flaviscutellaris Roberts, 1929: 566. Hull, 1973: 261. Evenhuis, 1983a: 472. Daniels, 2004: 1009.
Acridophagus flaviscutellaris (Roberts). Evenhuis, 1989: 360; 2002a: 17; Evenhuis & Lamas 2017: 44 (misidentification).
Cyrtomorpha flaviscutellaris [as Unplaced in Psiloderoidinae]. Evenhuis, 2024b: 22.

Types. Holotype ♀ and paratype ♀ from AUSTRALIA: **Western Australia**: Swan River, November, L.J. Newman. Holotype (originally in the Macleay Museum) now in ANIC.

Other specimen examined: AUSTRALIA: **Western Australia**: 1♀, Stratton (Perth), 32.4059°S, 116.0440°E, 14 Oct 2012, J. & F. Hort, on sandy ground (WAMP).

The holotype and paratype (Figs. 29–30) are glued face down on the same card (the holotype on the left side as viewed from the front of the specimens). Although neither specimen is marked as holotype, Roberts's (1929) observation that the paratype has an incomplete M_1 (not reaching the wing margin) fits the wing still attached to the specimen to the right of the pin (when viewed from the front, i.e. viewing specimens head-on). Thus, the holotype must be the specimen on the left. The mouthparts were originally obscured by the position of the head of the holotype glued directly to the card mount [which probably led subsequent workers to believe the species had vestigial mouthparts thus misidentifying it with what is now known to be *Xymrod* (*vide infra*)]. I have relaxed the holotype specimen and successfully teased out the mouthparts so that they are now evident, but it appears possibly broken off as the recently collected specimen has mouthparts more developed (these could also be extended from a retracted position [with only three specimens and only one in good condition, it is difficult to be sure]). Both specimens have damaged thoraces, possibly from mishandling since the mount of the type specimens is very high on the pin and, if not carefully done, fingers picking up the specimens by the pin could easily touch the specimens. The holotype has the dorsomedial portion of the mesothorax and all of the scutellum missing; both wings are broken off the specimen (the one wing glued to the card is of the paratype [vein M_1 is incomplete (not reaching the wing margin) as mentioned in the original description]). Roberts's (1929) original description is good except that there is a small bit of yellow color evident laterally on tergite I.

Redescription (from recently collected specimen without damage)
Female (Fig. 2). Length: 3.3 mm; wing: 3.2 mm. *Head*. Black, occiput grayish black; eyes dichoptic, separated at antennae by distance between lateral ocelli, antennal indentation distinct, large, level above antennal sockets; vertex and occiput black, occiput with white



Figures 29–30. *Povno flaviscutellaris* (Roberts). Holotype (left) and paratype (right) on card mount. **29**. Oblique frontal view; **30**. Dorsal view (holotype on right).

decumbent hairs; frons concave medially, shining black; face dull yellowish-orange, pointed at oral tip, with long yellowish white hairs at apex; antenna black; scape and pedicel subcylindrical, slightly wider than long; first flagellomere subconical, length about 2.5× greatest width; second flagellomere long, cylindrical, about 2/5 length of first flagellomere, with small apical style; proboscis dark brown, thin, length longer than oral margin (short in types [possibly retracted from full length]); labellum thin, about 1/3 length of proboscis; palpus not evident.

Thorax (Fig. 32). Mesonotum matte black, with orange-yellowish areas as follows: humeral callus coalesced with interhumeral marks, notopleural strip and supra-alar area, postalar callus, and large squarish prescutellar mark, mesonotum with long, dense erect brownish hairs, yellowish white hairs anteriorly, intermixed with brown hairs anterodorsally, hairs on orange-yellow areas concolorous with ground color; scutellum orange-yellow with dense erect yellowish hairs; pleurae yellowish, mottled black on anepisternum; katepisternum grayish black; pleurae with sparse yellowish hairs; halter stem orange, knob yellow with brown medially.

Legs. Yellow to yellowish orange, brown on apicalmost tarsal segments; femora with dense, long white hairs; tibiae with shorter yellowish white hairs. Pulvilli oval, as long as claws.

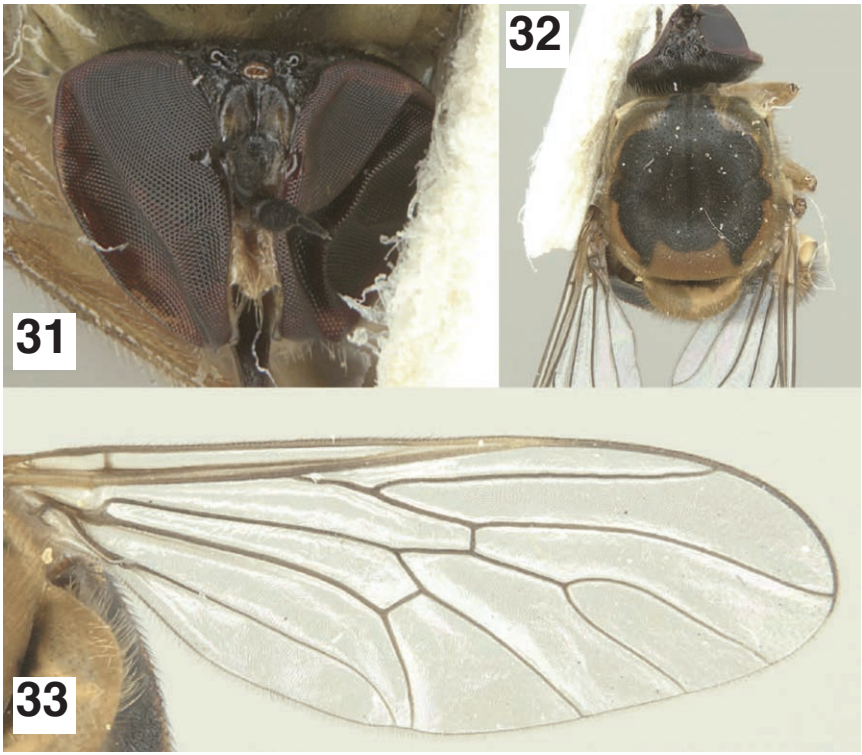
Wing (Fig. 33). Gray-hyaline; veins dark brown, except yellowish brown area of costa near end of R_1; costa ends slightly beyond end of R_{4+5}; vein Sc ending in wing margin just before level of origin of vein R_{2+3}; R_{2+3} subequal in length to R_{4+5}, originating at midway point of Rs, ending in wing margin at level three-fourths way along R_{4+5}; Rs distinctly connected to R_1, not evanescent at R_1; R_{4+5} slightly sinuous at wing margin; crossvein dm-cu closing cell dm absent; r-m crossvein placed slightly before middle of vein M_{1+2}; vein M_1 straight toward wing margin after initial curve basally; M_2 fairly straight to wing margin; anal cell open at wing margin, width ¾ that of r-m crossvein; CuP mostly straight to wing margin, slightly downcurved at wing margin, anal lobe slightly narrowed; fringe of short hairs on posterior margin of wing. Wing Interference Pattern generally blue-green with (successively) bands of purple, yellow and dark blue along poster margin of wing; cells r2+3 and r4+5 with bright green patches of color apically; cell cup predominantly magenta; anal lobe predominantly dark blue.

Abdomen. Broader than thorax; dorsum broadly black on medial portion of tergites I–II, yellowish orange elsewhere, with scattered white hairs, densest laterally; yellow color laterally on tergites I–VII, extending medially as posterior fasciae on segments II–VII, becoming broader on each successive tergite going posteriorly; venter brown, with yellowish color on posterior portion of segments.

Genitalia. Not dissected.

Male. Unknown.

Remarks: Roberts (1929) originally described this species in *Cyrtomorpha*, which he had separated from *Cyrtosia* in his key by having short mouthparts, shorter than the head; whereas he claimed *Cyrtosia* had mouthparts longer than the head. At the time, no specimens were known of the Australian grasshopper egg pod predators (which have vestigial mouthparts), so Roberts was essentially correct in placing the species in the only known Australian genus that had short mouthparts, *Cyrtomorpha*. The fact that his description includes characters of the wing and mesonotum and scutellum, which are now damaged, gives evidence that the specimens glued to the card mount were once complete specimens.



Figures 31–33. *Povno flaviscutellaris* (Roberts). **31**. Head, frontal; **32**. Thorax, dorsal; **33**. Wing.

The damage to them came later. They may have been remounted after Roberts (1929) because, in his description, Roberts did notice the short mouthparts, which were obscured by glue underneath the head when I had borrowed the types for examination. It is impossible to know when the damage to the types took place, but possibly before Fuller (1938) wrote her paper, since it is possible K.H.L. Key examined the types after collecting and rearing the specimens mentioned subsequently by Fuller; if so, he would have seen the specimens with heads glued to the card in such a way that it appeared there were no mouthparts extending beyond the oral margin. Other external characters of the female types are similar enough to the new genus *Xymrod*, that the emerged adults reared from the grasshopper egg pods could have been misidentified as *Cyrtomorpha flaviscutellaris*.

Roberts (1929) description is repeated here, which gives more detail than can be currently seen on the surviving parts of the holotype and paratype:

> "♀. Head black; occiput flattened, covered with sparse erect, black hairs; eyes widely separated; ocellar tubercle black, crowned with erect black airs; frons broad, concave and black, yellow on each side and close to the antennae, having a few black hairs; antennae black, the first and second segments with some short, yellowish hairs.

Thorax black with yellow humeral angles, brownish anteriorly, posteriorly, and laterally, the black area reaching forward as a short neck; the black area with numerous short, erect black hairs, the brown area with similar yellow hairs; pleurae yellowish with sparse yellow hairs; scutellum yellow with sparse yellow hairs; halteres yellow. Abdomen broad and rounded, yellow, the basal segment and the main portion of the second segment black, the whole with numerous short, erect black hairs. Legs brownish-yellow, covered with pale hairs. Wings hyaline, the inner margin fringed with short cilia; R_5 [= R_{4+5}] meets the margin beyond the apex; R_{2+3} long and almost straight; cell R [= br] a little longer than cell M [= bm]."

Paramonov made notes on the type (undated) and mentioned the damage found in the two specimens during his examination, so it probably occurred sometime in the intervening 40 years from its original description in 1929 to Paramonov's examination sometime before his death in 1967.

Specimens of this species in the Perth area of Western Australia were photographed (cf. Fig. 68) and one specimen was collected.

Qaysug Evenhuis, gen. nov.

Type species: *Qaysug parvissimus* (Roberts, 1929), by present designation.

Diagnosis: Similar to the Australian genera *Tolkunia*, gen. nov and *Povno*, gen. nov. on the basis of a shared position of the r-m crossvein at or before the middle of the discal cell. It can be separated from both by the following: incision on inner eye margin at level of antennal sockets (this incision clearly above the level of antennal sockets in *Tolkunia* and *Povno*), the scutellum with sparse short hairs on middle of disc (these hairs longer, and denser in *Tolkunia* and *Povno*), and the Wing Interference Pattern having a broad band along the posterior margin (this band absent in most species of *Tolkunia* and not found in *Povno*).

Etymology. The name derives from the fantasy dragon, whose full name is Qaysug, The Skinny One; and refers to the generally thin abdomen of the males. The name is pronounced as "Kay-sugg" and is treated as masculine.

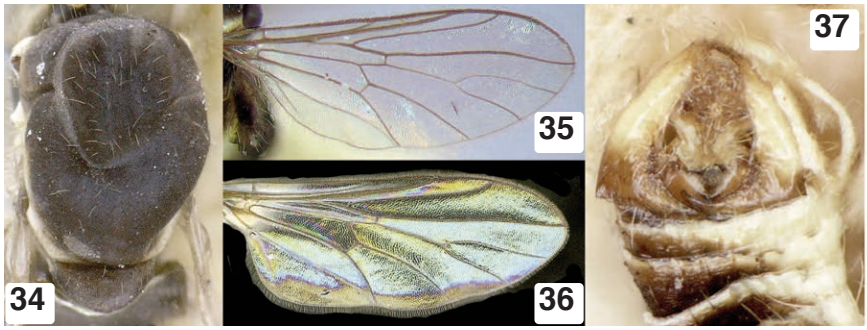
Included species: *Qaysug parvissimus* (Roberts), **comb**. **nov**.

Qaysug parvissima (Roberts), comb. nov.
(Figs. 3, 16, 34–42)

Cyrtosia parvissima Roberts, 1929: 567. Hull, 1973: 256. Evenhuis, 1983a: 484, 2002a: 24. Daniels, 1985: 83. Gharali *et al*., 2010: 151.
Acridophagus parvissimus (Roberts). Evenhuis, 1989: 360, 2012 [unpaginated].
Cyrtosia parvissima [as Unplaced in Psiloderoidinae]. Evenhuis. 2024b: 22.

Types. Holotype ♂ and paratype ♀ from AUSTRALIA: **Queensland**: Gogango [23.68144°E, 150.0346°E], 29 Mar 1929, A.P. Dodd (QM).

Other specimens examined. AUSTRALIA: **Queensland**: 9♂, 5♀, Mt Moffatt [= Carnarvon] National Park Headquarters, 25°01′S, 147°47′E, 740 m, 17 Nov 1995, C. Burwell (QM); 1♀,same data except, 28 Nov 1995, C. Burwell (QM); 1♀,same data except 25°04′39″S, 148°00′03″, 20 Nov 1995, C. Burwell (QM). **New South Wales**: 1♂, Ku-ring-Gai [Chase] National Park [33.627°S, 151.224°E], 28 Dec 1992, heath dry sclerophyll, D.J. Bickel (AMS). **Northern Territory**: 1♀, 56 km S by E of Alice Springs [24.2975°S, 134.2600°E], 3 Oct 1978, D.H. Colless (ANIC); 2♂, 39 km E Alice Springs [23.69357°S, 134.2213°E], 6 Oct 1978, D.H. Colless (ANIC).



Figures 34–37. *Qaysug parvissimus* (Roberts), male. **34**. Thorax, dorsal; **35**. Wing; **36**. Wing Interference Pattern. **37**. Hypopygium *in situ*.

Redescription

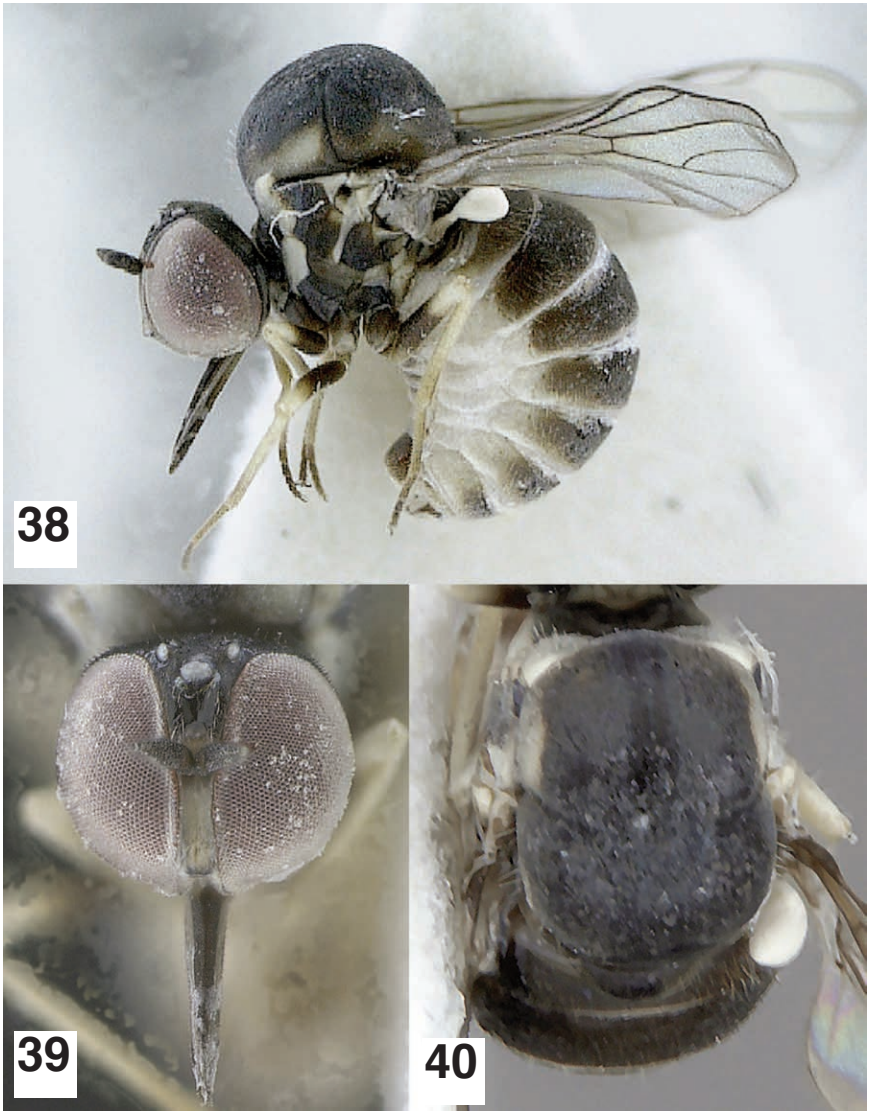
Male (Fig. 3). Length: 2.0–2.3 mm; wing: 2.1–2.2 mm. *Head*. Black; eyes dichoptic, separated at antennae by distance between lateral ocelli; vertex, frons and occiput black, occiput with sparse white decumbent hairs; frons concave medially, black; face slightly longer than frons, pointed at oral tip, yellowish white with, with sparse short white hairs at apex; antenna (Fig. 3) black; scape and pedicel subcylindrical, slightly wider than long; first flagellomere ellipsoid, length about 2.5× greatest width; second flagellomere long, cylindrical, about 4/5 length of first flagellomere, with small apical style; proboscis dark brown, pointed apically, length shorter than head height; labellum about 1/2 length of proboscis; palpus not evident.

Thorax. Humpbacked, mesonotum and scutellum matte black, with sparse whitish hairs; humeral callus, spot below anterior spiracle, and postalar callus yellowish; pleura predominantly brown to black; halter stem and knob yellow.

Legs. Coxae and basal 4/5 of femora brown, yellow apically; tibiae and tarsal segment I yellow, tarsal segments II–V brown. All legs with short yellowish hairs. Pulvilli ovoid, subequal in length to claws.

Wing (Fig. 35). Hyaline; veins brown; costa ends slightly beyond end of R_{4+5}; vein Sc ending in wing margin slightly beyond level of origin of vein R_{2+3}; R_{2+3} two-thirds length of R_{4+5}, originating at midway point of Rs, ending in wing margin at level midway along R_{4+5}; Rs sclerotized at connection with R_1; R_{4+5} straight to wing margin; r-m crossvein at basal on-fourth vein M_{1+2}; vein M_1 curved toward wing margin; M_2 slightly sinuous to wing margin; crossvein dm-cu closing cell dm absent; CuP curved at wing margin; A_1 ends one-way along anal lobe; anal cell open at wing margin; anal lobe normal; alula absent; fringe of short hairs on posterior margin of wing. Wing interference pattern (Fig. 36) pale brassy blue-green with broad band along posterior margin from M_1 to anal lobe.

Abdomen. Dorsum predominantly matte black, with thin white along posterior margins of tergites, with scattered white hairs, black hairs medially on tergite I–V; yellow color laterally on tergites II–VII, becoming broader on each successive tergite going posteriorly; venter with sternite I yellow, sternites II–VII brown.



Figures 38–40. *Qaysug parvissimus* (Roberts), female. **38**. Habitus, lateral. **39**. Head, frontal; **40**. Thorax, dorsal.

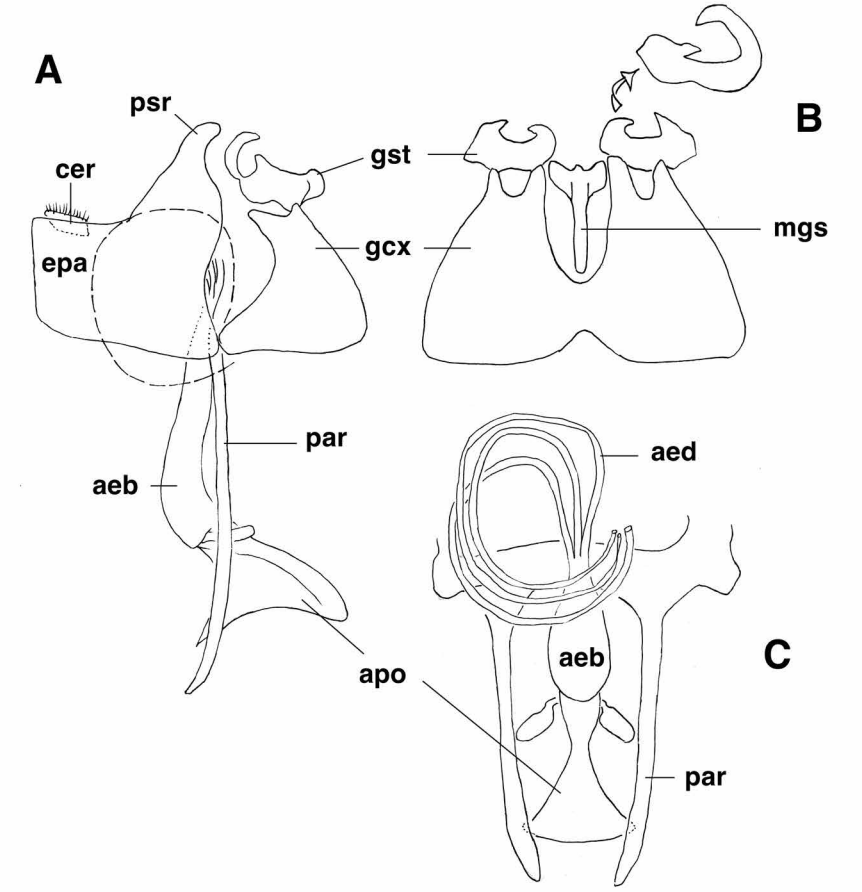


Figure 41. *Qaysug parvissimus* (Roberts), male genitalia. **A**. Lateral view; dashed lines indicate placement of coiled aedeagus. **B**. Gonocoxites, dorsal view, with detail of gonostylus. **C**. Phallic complex, ventral view. Abbreviations: aeb = aedeagal bulb; apo = aedeagal apodeme; aed = aedeagus; cer = cercus; epa = epandrium; gcx = gonocoxa; gst = gonostylus; mgs = medial gonocoxal strip; par = lateral arm of parameral sheath; psr = pseudosurstylus.

Genitalia (Fig. 41). Rotated 90°; epandrium (Fig. 41A) yellow with brown pseudosurstylus, large, pointed process of pseudosurstyli darkly sclerotized; cerci large, ovoid, sparsely setose; gonocoxa subconical in dorsal view, fused basally with deep medial cleft harboring sclerotized T-shaped medial gonocoxal strip, basal portion of strip not connected to gonocoxa, apical portion of "T" associated with gonostyli; gonostyli hook shaped in lateral view, broad in dorsal view; lateral arms of parameral sheath long, thin, as long as basiphallic complex; aedeagal bulb long, thin, ovular; aedeagal apodeme curved in lateral view, flared apically in ventral view; distiphallus (aedeagus) trifid, very long, coiled.

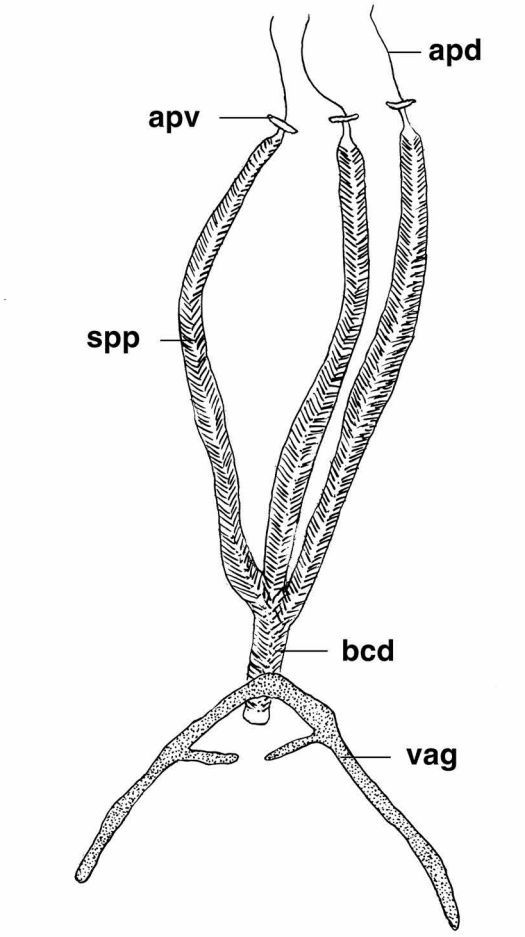


Figure 42. *Qaysug parvissimus* (Roberts), female genitalia. Abbreviations: apd = apical spermathecal duct; apv= apical valve; bcd = basal common duct; spp = sperm pump.

Female (Fig. 38). As in male, except mesonotum (Fig. 40) with humeral callus, interhumeral mark poster humeral area and propleuron white; venter of abdomen white with thin brown color medially; genitalia (Fig. 42) with genital fork V-shaped; basal duct indistinguishable from sperm pump; sperm pump thick, with minute spiky texture, apically narrowed and clear to apical valve; apical valve disc-shaped, sclerotized; apical spermathecal duct extremely thin basally [remainder of apical duct and reservoir not recovered during dissection].

Remarks. After initially treating this species in *Acridophagus* (Evenhuis 1989), I transferred it *Cyrtosia* in my world catalog (Evenhuis 2002a). However, re-examination of the species and comparison with *Cyrtosia* showed it not to belong to that genus and the revised Australasian catalog placed it back in *Acridophagus* (Evenhuis 2012). Comparison with true *Acridophagus* (specimens listed in this study; *vide supra*) show it to not belong to any previously described genus; thus, it is here transferred to *Qaysug*, gen. nov. as *Q. parvissima* (Roberts), **comb. nov**.

Tolkunia Evenhuis, gen. nov.

Cyrtomorpha (misidentification). Bowden, 1975: 309.
Cyrtosia (misidentification). Colless, 1983: 76.
Acridophagus (misidentification). Yeates, 1994: 46, 55, 105.
New genus B. Evenhuis 2022: 2.

Type species: *Tolkunia hibisci* Paramonov & Evenhuis, **sp**. **nov**., by present designation.

Diagnosis. Separated from other Australian Mythicomyiidae by the well-developed mouthparts possessing a tubular proboscis extending beyond the oral margin (it type species well beyond, in some undescribed species, much shorter) combined with the r-m crossvein being placed before the middle of cell dm. The incision on the inner eye margin is above the level of antennal sockets. The face is extremely short, one-fifth to one-third length of frons.

Remarks. Paramonov had apparently begun to work on this group and sorted out a number of new species, placing them in the genus *Cyrtosia*. Although there were no descriptions of his new putative species found in his notes, he did key out five new species and labelled types, one species of which has a long series and is described here (*Tolkunia hibisci*). As this is a fairly speciose genus with many new species that have come to light with recent surveys using fine mesh Malaise traps and water pan traps, descriptions of all of which are beyond the scope of this paper, a full revision of the genus is being conducted and will be published separately.

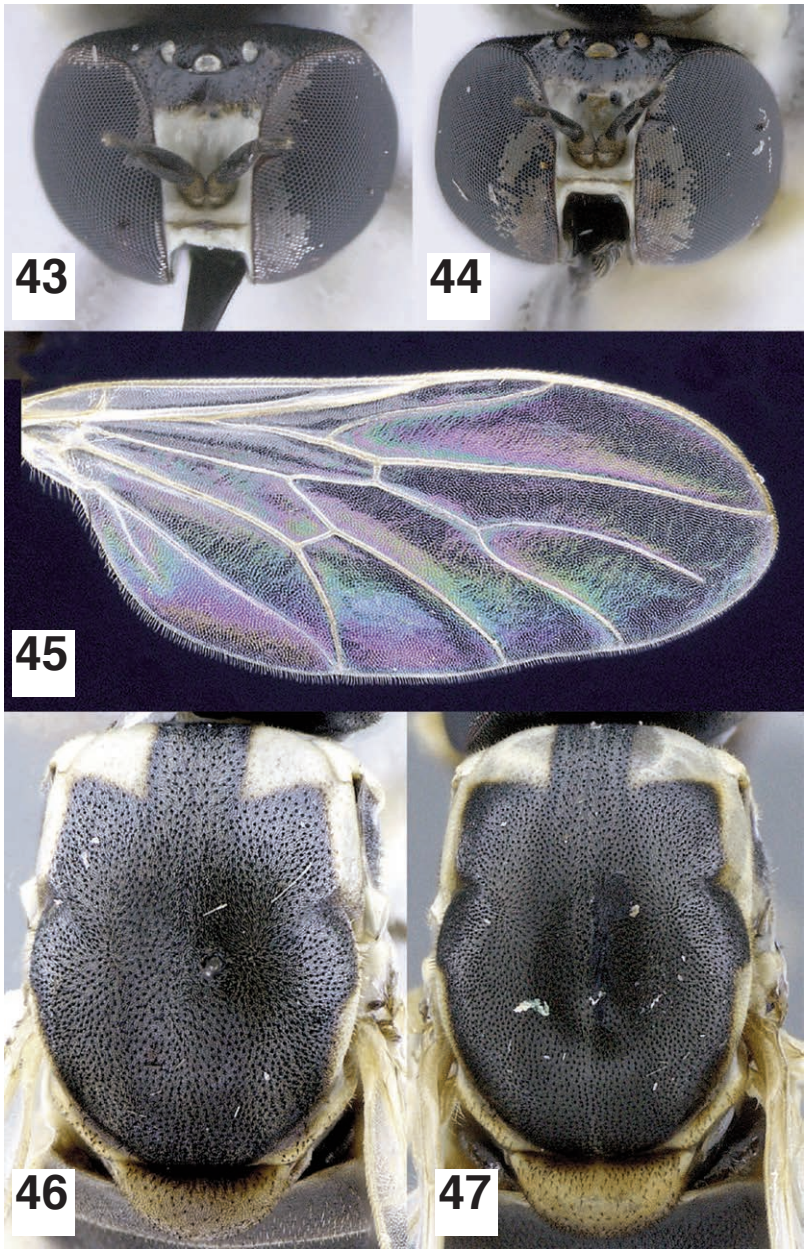
Specimens of an undescribed species from Western Australia (cf. Fig. 69) were photographed and are included here for use in comparing with other specimens of Australian Psiloderoidinae photographed in life.

Etymology. The genus-group name derives from the South Australian aboriginal "*tolkunia*" [= piercing], referring to the long, thin, tubular proboscis of the type species with a pointed apex, reminiscent of a piercing syringe. The named is treated as feminine.

Included species. *Tolkunia hibisci* Paramonov & Evenhuis, **sp**. **nov**.

Tolkunia hibisci Paramonov & Evenhuis, sp. nov.
(Figs. 4, 10, 43–49)

Types. *Holotype* ♂ and 6♀ paratypes from AUSTRALIA: **Northern Territory**: Stuart Highway, 10 km N Newcastle Creek, 17°11′20″S 123°28′08″E, *Gossypium* flowers, 9 Jan 2001, S.E. McEvey (AMS). *Other paratypes*: **Northern Territory**: 13♂, 9♀, Illugnarra, 90 km SW by S Urandangi, 16 Oct 1978, on *Hibiscus*, D.H. Colless (9 pairs collected *in copula*) (ANIC); 15♂♀, 10 km Brunette Downs, 25 Apr 1976, D.H. Colless, on *Hibiscus* flowers (ANIC); 2♂,1♀, Jabiluka W[orld] H[eritage], 22 Aug 1978, D.H. Colless (ANIC); 3♂, 3♀, 10 km N. Ti Tree, 11 Dec 1988, R.R.



Figures 43–47. *Tolkunia hibisci* Paramonov & Evenhuis, sp. nov. **43**. Male head, frontal; **44**. Female head, frontal; **45**. Wing Interference Pattern. **46**. Male thorax, dorsal, **47**. Female thorax, dorsal.

Snelling, J. Trey (LACM); 1♂, 1♀, 31 km E Camooweal, 12 Dec 1988, R.R. Snelling, J. Trey (LACM); 1♂, 1♀, Ellery Creek Gorge National Park, 82 km W Alice Springs, 1 Oct 1983, E.I. Schlinger, M.E. Irwin (INHS); 14♀, 18 km S Tennant Creek, 28 Sep 1983, E.I. Schlinger, M.E. Irwin (INHS). **Queensland**: 88♂♀, McPherson Range, 12 Nov 1949, S.J. Paramonov (1♂,1♀ *in copula*) (ANIC); 1♂,1♀, N. corner of Bentinck Is, 25 May 1960, P. Aitken, N.B. Tindale (SAM); 15♂♀, Nr. Jaynah Creek, 10 mi S. Ardmore Stn, 63 mi SW Mt Isa, on *Hibiscus*, 28 Sep 1977, J.A. Forrest (SAM). **South Australia**: 19♂♀, Mt. Illbillee, Everard Range, 5 May 1983, G.A. Holloway (AMS). Holotype in AMS. Paratypes in AMS, ANIC, INHS, LACM, SAM, USNM, and BPBM.

Description

Male (Fig. 4). Length: 2.7–3.5 mm; wing 3.0–3.8 mm. *Head*. Black; eyes dichoptic, separated at vertex by two times distance between lateral ocelli; inner eye margin parallel from just below ocellar tubercle to oral margin; vertex and occiput black, occiput with microscopic yellowish white decumbent hairs; frons with depression medially, black on upper one-third, white below, with microscopic hairs on black portion, bare elsewhere; incision on inner eye margin above level of antennal sockets; face white; antenna (Fig. 43) with scape and pedicel subcylindrical, slightly wider than long; scape yellowish brown, pedicel brown; first flagellomere black, linear, length about 3× greatest width; second flagellomere long, cylindrical, about two-thirds length of first flagellomere, with small apical style; postgena dark black; proboscis long, black, pointed apically, length ca. three times head height; labellum about 1/6 length of proboscis; oral cavity large; mentum white; palpus not evident.

Thorax (Fig. 46). Mesonotum subshining black, with microscopic black hairs hairs; scutellum yellowish brown with black hairs; yellow color uninterrupted from interhumeral area and humeral callus to postalar callus; pleura black, with white on anterior spiracle, propleuron, posterior portion of anepisternum, upper meron just below posterior spiracle, and at wing base; halter stem yellow, knob white.

Legs. Bare; coxae and basal 5/6 of femora dark brown, yellow at extreme apex; tibiae and tarsal segments I–IV yellow, tarsal segment V brown. Pulvilli spatulate, three-fourths length of claws, claws brown, black apically with microscopic setae.

Wing (Fig. 45). Hyaline; veins yellow; costa ends beyond end of R_{4+5} one-third way to M_1; Sc ending in wing margin at level of origin of vein R_{2+3}; R_{2+3} shorter than R_{4+5}, originating at midway point of Rs, ending in wing margin at level midway along R_{4+5}; Rs sclerotized at connection with R_1; R_{4+5} fairly straight to wing margin; r-m crossvein placed at basal three-fifths of vein M_{1+2}; vein M_1 slightly curved toward wing margin; M_2 sinuous to wing margin; crossvein dm-cu closing cell dm absent; anal cell closed at wing margin; anal lobe normal; alula extremely reduced; fringe of short hairs on posterior margin of wing.

Abdomen. Dorsum predominantly subshining black, with microscopic black hairs; yellow color laterally; yellow to white posterior fasciae on segments II–VII, becoming broader on each successive tergite going posteriorly; venter yellowish white, brown thin medial stripe on sternites II–V.

Genitalia (Fig. 48). Epandrium subtrapezoidal in lateral view, with large, broad, apically pointed pseudosurstylus, pseudosurstylus darkly sclerotized apically; cercus thin, ellipsoid, held mainly within epandrium and not well exerted; gonocoxites subtriangular in lateral view, fused basally with deep cleft medially (in dorsal view), medial area con-

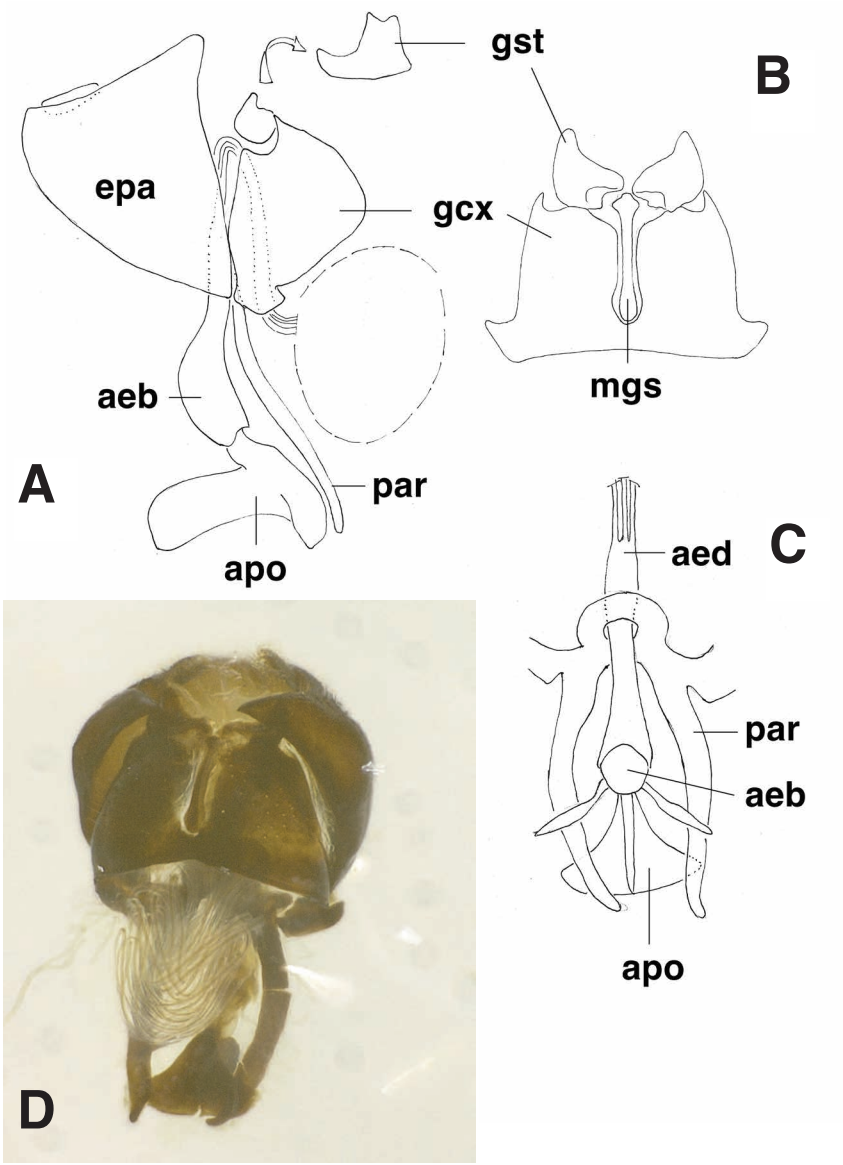


Figure 48. *Tolkunia hibisci* Paramonov & Evenhuis, sp. nov., male genitalia. **A**. Lateral view; dashed lines indicate placement of coiled aedeagus. **B**. Gonocoxites, dorsal view. **C**. Phallic complex, ventral view. **D**. Genitalia showing coiled aedeagus *in situ*. Abbreviations: aeb = aedeagal bulb; aed = aedeagus; apo = aedeagal apodeme; epa = epandrium; gcx = gonocoxa; gst = gonostylus; mgs= medial gonocoxal strip; par = lateral arm of parameral sheath.

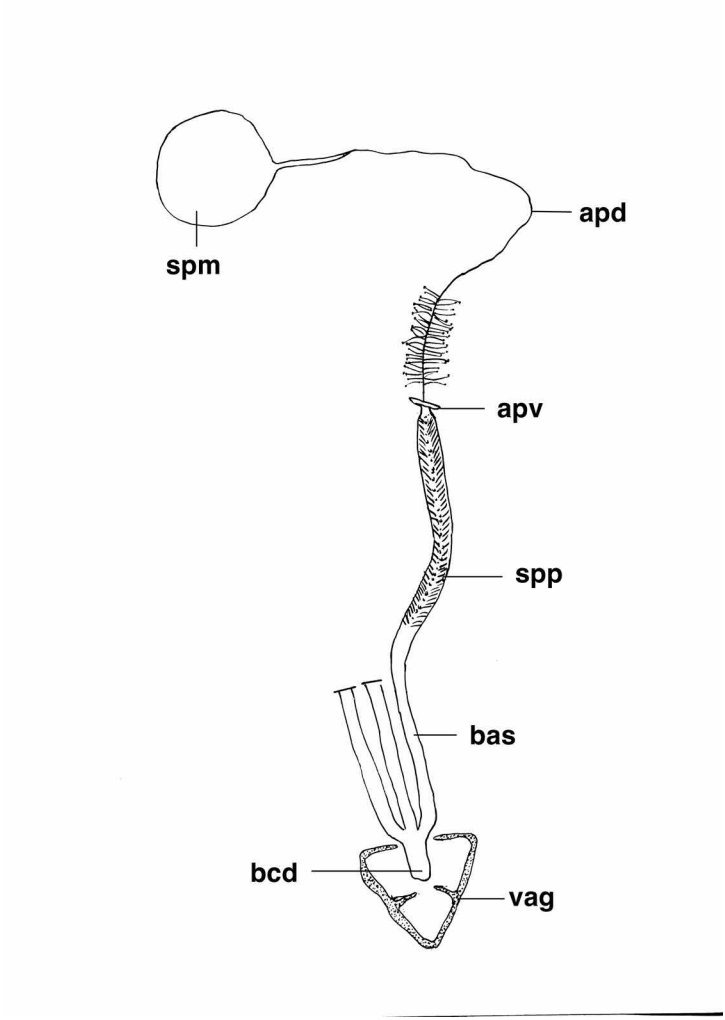


Figure 49. *Tolkunia hibisci* Paramonov & Evenhuis, sp. nov., female genitalia (only one of three spermathecae shown). Abbreviations: apd = apical spermathecal duct; apv= apical valve; bas = basal spermathecal duct; bcd= basal common duct; spm = spermathecal reservoir; spp = sperm pump; vag = genital fork.

taining long, thick sclerotized medial gonocoxal strip ending in a "Y" apically and associated with gonostyli; gonostylus thick, subtriangular in dorsal view, hook-shaped in lateral view; parameral sheath thick in dorsal view, with its lateral arms long, thin extending slightly beyond aedeagal apodeme; basiphallus with aedeagal bulb long, ellipsoid-ovular, with linear-lanceolate lateral rami; distiphallus with aedeagus trifid, extremely long, thin,

coiled multiple times within genital capsule [extending during copulation and often left uncoiled and exposed externally after copulation; *in copula* specimens often collected still connected by long thin aedeagus].

Female. As in male; genitalia (Fig. 49) with genital fork V-shaped, with medial inward directed process, apex of each arm of "V" directed inward; common basal duct relatively short, thick, length one-half length of genital fork, trifid with each duct long, thin, ca. length of sperm pump; sperm pump long, thin, narrowed at extreme apex, basal valve not evident, apical valve small, disc-shaped; apical duct thin, long (length ca. two times sperm pump), with trichomes at basal one fifth; spermathecal reservoir globular, unsclerotized.

Remarks. This is one of the more common and widespread species of the genus *Tolkunia* and seem to prefer malvaceous flowers, having been recorded from flowers of *Hibiscus* and *Gossypium*. Specimens were collected in large numbers from these flowers and many were also collected *in copula*, which may indicate that these flowers act as a lekking site. A similar situation of specimens congregating in flowers for mating occurs in species of the bombyliid genus *Usia* (Merle, 1971). Paramonov wrote a short unpublished note on the adult behavior of this species: "The author has found *C. hibisci* (about 50 males, 40 females) on the flowers of the small *Hibiscus* sp., but the number of flies was very high; almost each flower contains 2–3 specimens searching for pollen." Paramonov is given co-authorship due to his having discovered the new species and for providing some of the characters used in defining this species.

NB: As in *Qaysug*, the apical ducts and spermathecae of the female genitalia are unsclerotized and extremely delicate, making dissection and identification of parts extremely difficult; and it is very common to not be able to retrieve the spermathecal reservoirs during dissection. Care should be taken when dissecting to remove the entire abdomen as the genitalic ducts can extend the full length of the abdomen in some species.

Etymology. The specific epithet is the name given by Paramonov in his notes on this species.

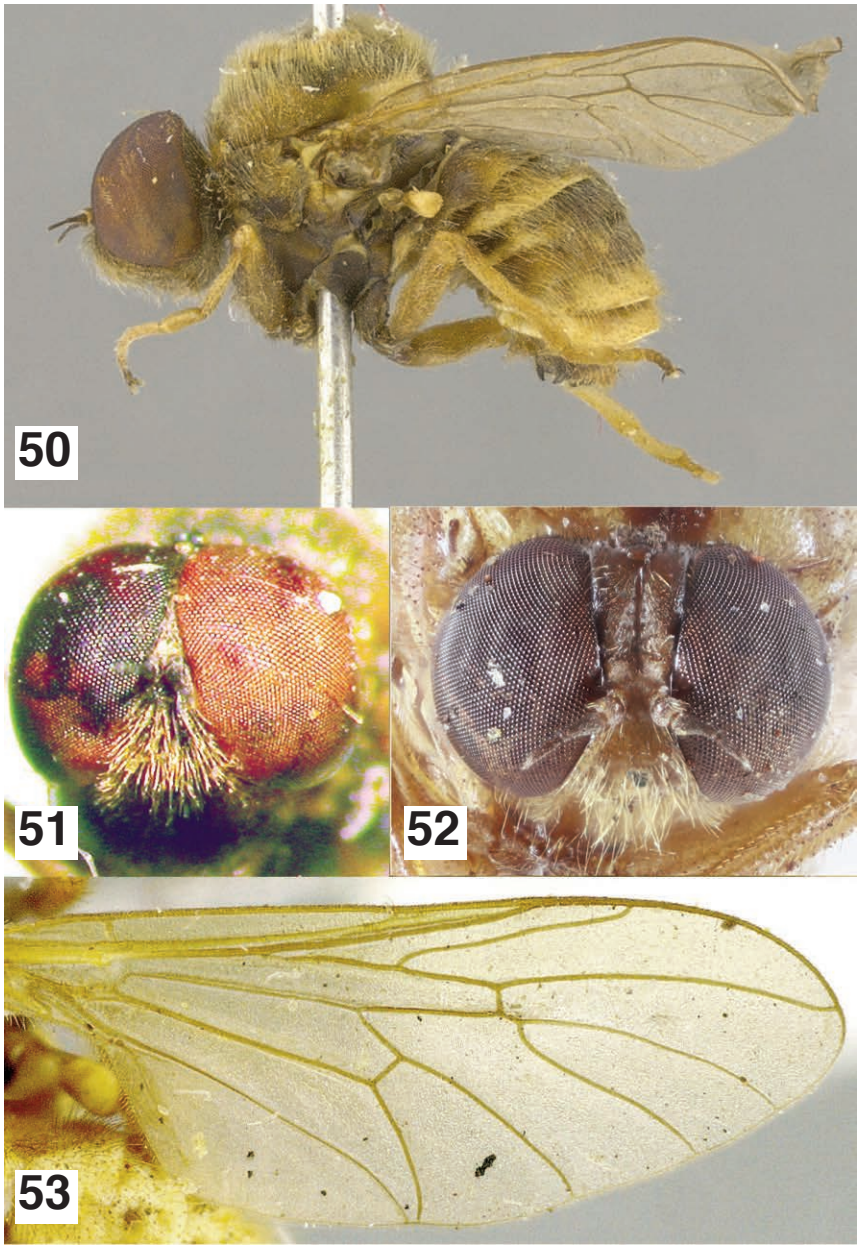
Distribution Australia (Northern Territory, Queensland, Southern Australia).

Xymrod **Evenhuis**, **gen**. **nov**.

Cyrtomorpha White (misidentification). Jenkins, 1937: 377; 1940: 234. Fuller, 1938a: 202; 1938b: 100. Andrewartha, 1939: 99. Clausen, 1940: 381. Hennig, 1952: 92. Painter, 1962: 255. Greathead, 1963: 481. Painter & Painter, 1965: 419. Key, 1970: 330. Merle, 1972: 196; 1975: 46. Hull, 1973: 259. Andersson, 1974: 29. Colless, 1977: 90, 1983: 76. Hinton, 1981: 223. Farrow, 1982: 199. Zaitzev 1992: 16. Walker *et al.* 2007: 495.
Psiloderoides Hesse (misidentification): Evenhuis, 1989: 360, 1994: 338.
Acridophagus Evenhuis (misidentification). Rentz, 1991: 377. Yeates & Greathead, 1997: 157.
Gubba Evenhuis, 2002a: 5. *Nomen nudum*.
New genus A. Evenhuis 2022: 2.

Type species: *Xymrod pilosa* Evenhuis, **sp**. **nov**., by present designation.

Diagnosis: Large-sized mythicomyiids (6–8 mm in length) with head set low on the prothorax in some species giving a humpbacked appearance to the body and densely pilose face and mesonotum in males. It is similar in appearance to *Psiloderoides* Hesse and in having reduced/vestigial mouthparts, but can be distinguished from it by the following:



Figures 50–53. *Xymrod pilosa* Evenhuis, sp. nov. **50**. Male habitus; **51**. Male head, frontal view. **52**. Female head, frontal view. **53**. Wing.

lack of vein dm-cu closing cell dm (present in *Psiloderoides*); the antennal pedicel is as wide as or narrower than first flagellomere (pedicel much wider than the antennal flagellomere in *Psiloderoides*); the anal cell is not reduced (very thin in *Psiloderoides*, and there is no apparent dimorphism in size between males and female (females distinctly much larger than males in *Psiloderoides*).

Etymology: The genus-group name is a mythical dragon, whose full name is Xymrod, The Voiceless, which seems apt for this genus, members of which possess mouthparts that are vestigial and non-functioning. Gender is feminine.

Included species: *Xymrod pilosa* Evenhuis, **sp**. **nov**.

***Xymrod pilosa* Evenhuis, sp. nov.**
(Figs. 5, 9, 50–58)

Cyrtomorpha flaviscutellaris Roberts (misidentification). Jenkins, 1937: 377; 1940: 234. Fuller, 1938a: 202; 1938b: 100. Andrewartha, 1939: 99. Clausen, 1940: 381. Hennig, 1952: 92. Greathead, 1963: 481. Key, 1970: 330. Merle, 1972: 196; 1975: 46. Hull, 1973: 553. Andersson, 1974: 29. Centre for Overseas Pest Research, 1982: 425. Farrow, 1982: 199. Walker *et al*. 2007: 495. Kirk-Spriggs & Evenhuis, 2008: 126.

Cyrtomorpha paganica White: (misidentification). Hull, 1973: 553 [genitalia illustrations].

Crytomorpha flavoscutellaris: (misidentification; misspelling). Hinton, 1981: 223.

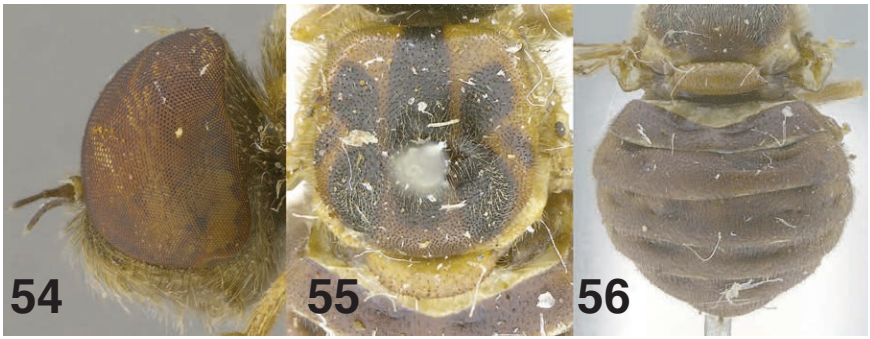
Psiloderoides sp. (in part) Evenhuis 1989: 360 (misidentification).

Acridophagus flaviscutellaris Roberts (misidentification). Rentz, 1991: 377. Dangerfield *et al*., 2001: 32. Horning, 2004: 95.

Types. Holotype male from AUSTRALIA: **Western Australia**: Merredin [31.31°S, 118.14°E], 28 Dec 1971, ex grasshopper eggs (WADA). Holotype deposited in WADA. **Paratypes**: AUSTRALIA: **Western Australia**: 1♂, 2♀, Campion, emerged on 22 Dec 1939, 8 Jan 1940, 12 Jan 1940, C.F.H.J[enkins] (all WADA); 2♂, 1♀, Nungarrin [31.11°S, 118.06°E], emerged 22 Dec 1939, 28 Dec 1939, 8 Jan 1940, C.F.H. J[enkins] (all WADA); 1♂, [Nungarrin, 31.11°S, 118.06°E], emerged 12 Nov 1936, (SAM ex Waite Institute); 1♂, Nth. Westonia [31.18°S, 118.42°E], emerged 9 Dec 1940, C.F.H.J[enkins], F.M. Hull Collection (CNC) [specimen dissected and illustrated in Hull (1973) as *Cyrtomorpha paganica*]; 2♀, Nth. Westonia [31.18°S, 118.42°E], emerged 6 Dec 1940, 17 Dec 1940, C.F.H.J[enkins] (all WADA); 1♂, Nth. Bencubbin [30.49°S, 117.50°E], emerged 10 Jan 1940, C.F.H.J[enkins] (WADA); 1♂, Campion [31.02°S, 118.29°E], emerged 8 Jan 1940, C.F.H.J[enkins]; 1♂, [locality not known], Jan 1939 (WADA); 1♂, "WA" [no further locality], "bred hopper eggs" (SAM).

Material not examined. The following are two further distributional records from Fuller (1938b) within the range of *Xymrod pilosa* referring to egg pod predation and rearings of larvae. However, no material of these specimens could be located during this study: AUSTRALIA: **Western Australia**: Kunnunoppin [31.11°S, 117.92°E]; Kellerberrin [31.64°S, 117.70°E].

Description
Male (Fig. 50). Length: 3.5–5.0 mm. *Head*. Predominantly black, normal in size related to thorax; eyes almost holoptic, separated at vertex by width of ocellar tubercle, narrowing to mid-frons where width is 1.5× single ommatidium, then widening again at antennal sockets; vertex and occiput black, occiput with fine yellowish decumbent hairs, longest on ventral half; face black-brown, slightly tumid, with dense yellowish hairs; broad incision of inner eye margin at level of antennal sockets; antenna (Fig. 54) with scape and pedicel brown, subcylindrical, slightly wider than long; first flagellomere black, linear-subconical, length about 3× greatest width; second flagellomere long, cylindrical, slightly



Figures 54–56. *Xymrod pilosa* Evenhuis, sp. nov. **54**. Male head, lateral view; **55**. Female thorax, dorsal; **56**. Female abdomen dorsal.

longer than first flagellomere, with small apical style; postgena black to brown, dense yellowish pilose; proboscis black, vestigial, a small nub; palpus not evident.

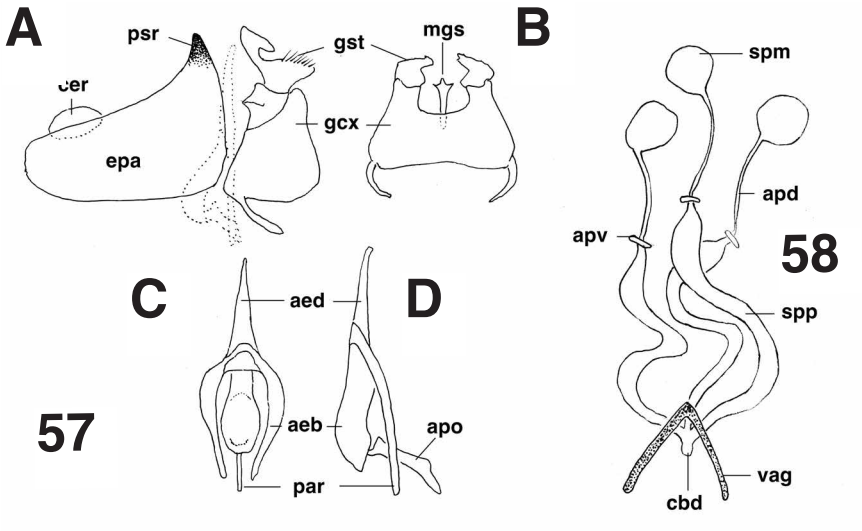
Thorax (Fig. 54). Mesonotum matte black on disc, surrounded anteriorly and laterally by yellow color, with long, dense wavy yellowish hairs, hairs curved backwards on anterior mesonotum; scutellum brown basally, yellowish posteriorly, with erect wavy yellowish pile; upper pleura black with yellow at anterior corners; lower pleura black; anepisternum dense yellow pilose; halter stem brown to yellow, knob white.

Legs. Dense short yellowish white pilose. Coxae brown; fore and mid femora brown basally, yellow apically; hind femur all yellow. Pulvilli obovoid, three-fourths length of claws.

Wing (Fig. 53). Subhyaline; veins brown; costa ends slightly beyond end of R_{4+5}; vein Sc ending in wing margin just before origin of vein R_{2+3}; R_{2+3} shorter than R_{4+5}, originating at midway point of Rs, ending in wing margin before midpoint of R_{4+5}; Rs sclerotized at connection with R_1; R_{4+5} slightly sinuous at wing margin; r-m crossvein placed at apical three-fourths of vein M_{1+2}; vein M_1 and M_2 slightly curved toward wing margin; crossvein dm-cu closing cell dm absent; anal cell closed at wing margin; vein CuP slightly curved to wing margin; vein A_1 ending at middle of anal lobe; anal lobe normal; alula extremely reduced; fringe of short hairs on posterior margin of wing.

Abdomen (Fig. 56). Dorsum matte brownish black medially on tergites I–V, yellowish laterally, with yellowish decumbent hairs, densest laterally; tergites VI–VII yellow; venter brown, with pattern as on tergites.

Genitalia (Fig. 57). Hypopygium dark brownish black; epandrium in lateral view subtrapezoidal, with broad pseudosurstylus darkly sclerotized at pointed apex; cercus ovular, partially exerted; gonocoxites fused basally, broadly and deeply cleft medially in dorsal view, with thin T-shaped medial gonocoxal strip, apical "T" associated with gonostyli; gonocoxa in lateral view subquadrate, higher than wide, with thin recurved ventral process; gonostylus broad basally, with complex hooked apex (best seen in Fig. 57A); basiphallus long, narrow, with arms of parameral sheath extending not quite as long as aedeagal apodeme; these arms thin in lateral view; aedeagal bulb long, ellipsoid; distiphallus with aedeagus conical, pointed apically.



Figures 57–58. *Xymrod pilosa* Evenhuis, sp. nov., genitalia. **Figure 57.** Male. **A**. Lateral view. **B**. Gonocoxites, dorsal view. **C**. Phallic complex, ventral view. **D**. Phallic complex, lateral view. **F**. Gonocoxae, dorsal view. Abbreviations: aeb = aedeagal bulb; apo = aedeagal apodeme; aed = aedeagus; cer = cercus; epa = epandrium; gcx = gonocoxa; gst = gonostylus; mgs = medial gonocoxal strip; par = lateral arm of parameral sheath; psr = pseudosurstylus. **Figure 58**. Female. Abbreviations: apd = apical spermathecal duct; apv= apical valve; cbd = common basal duct; spm = spermathecal reservoir; spp = sperm pump; vag = genital fork;

Female. Same as male except as follows: eyes dichoptic, width at vertex four times width of median ocellus; frons with median groove, parallel to level of antenna (not narrowed), brownish, darker brownish black along inner eye margin, with scattered erect yellowish hairs; face lighter brown than frons, yellow hairs at oral margin not dense; mesonotum with brown pattern as in Fig. 55; pilosity on thorax and scutellum shorter and less dense than male; scutellum orangish; abdomen generally all orange to brown, paler specimens with brown dot dorsolaterally on tergites. *Genitalia* (Fig. 58): with genital fork V-shaped, without inner or apical processes; basal common duct extremely short, leading to three thick tubular basal ducts; sperm pump sinuous, without basal valve, wide but narrowed at extreme to apical valve, apical valve small, disc-shaped; apical duct one-half length of basal duct+sperm pump, thin; spermathecal reservoir subglobular, not sclerotized.

Pupa (Fig. 59). Measurements. Overall length: 7.5–8.0 mm. Body (Fig. 59A) generally with sparse hairs dorsally and laterally. Head with cephalic armature (Figs. 59B) consisting of paired, apically sclerotized antennal sheaths on each side, each sheath broad, thick, pointed, basal lobe bifid; other cephalic sheaths typically present in other bombyliids absent, labral sheath reduced to bump. Thorax generally bare. Abdomen with tergite I without medial spines, a three long black setae at dorsolateral angle and two hairs laterally; tergites II–VII with 1–2 hairs laterally; tergites II–III with curved stiff hairs dorsally,

without barbs or thorns; tergites IV–VII each with 6 darkly thin sclerotized thorn-like spines medially becoming thicker on each succeeding segment. Tergite VIII without dorsal spines or vestiture. Tip of abdomen (Fig. 59C) with caudal armature consisting of thick paired spines each side, each darkly sclerotized apically, hooked 90°.

Distribution. Australia (Western Australia).

Remarks: This species has been misidentified as *Cyrtomorpha flaviscutellaris* in most of the literature, which stems from an early misidentification of material reared from grasshopper egg packets and the resulting publication in Fuller (1938a, 1938b). Examination in this study of the type material of *Cyrtomorpha flaviscutellaris* shows that it belongs in a new genus *Povno* (*vide supra*). The use of the misidentified name has been subsequently perpetuated in the literature dealing with Australian grasshopper parasitoids and predators. Hull (1973) thought that the specimens (a male and a female from Western Australia) he had described and illustrated were of *Cyrtomorpha flaviscutellaris*. He stated (Hull 1973: 260): "Although Roberts described the proboscis as short, not as long as the head and the palpus very small, one segmented, in the material before me the proboscis is a mere stump, and I find no trace of the palpus." A male specimen (now in CNC) used by Hull for genitalic dissection and illustration was located in this study and is *Xymrod pilosa*. Evenhuis (1989) listed *Psiloderoides* Hesse as occurring in New South Wales and Western Australia, based on undetermined specimens; the specimens from Western Australia are misidentifications that have since proven to be *Xymrod pilosa*.

Notes on biology and immatures. Fuller (1938b; figs 10–19) is the only person to have previously studied and described and illustrated the immatures of *Xymrod pilosa* (as "*Cyrtomorpha flaviscutellaris*").

Dangerfield *et al*. (2001: 32) stated that, despite numerous surveys for egg pod predators and parasites in New South Wales, no records of "*Cyrtomorpha flaviscutellaris*" had been found since Fuller (1938b). *Xymrod pilosa* is known only from Western Australia, and Fuller's (1938b) study referred to specimens from only Western Australia, but even so, findings of the species in Western Australia have also been rare: Fuller's paper referred to K.H.L. Key having collected "several" larvae for study in June 1936 and more in later months that year; however, only one specimen collected after 1940 (from 1971) was located during this study, examined, ands made the holotype.

Etymology: The specific epithet derives from the Latin, "*pilosa*" [= hairy] referring to the characteristic pilosity of the head, thorax, and abdomen in males.

Zzyzzarro Evenhuis

Zzyzzarro Evenhuis, 2022: 5. Evenhuis, 2024b: 22. Type species: *Zzyzzarro hortorum* Evenhuis, 2022, by original designation.

Diagnosis. Similar to *Acridophagus* in overall general appearance and possessing a wing with crossvein r-m well beyond the middle of cell dm, but can be separated from it by the proboscis exceeding the head height (proboscis barely extends beyond oral margin in *Acridophagus*), the parallel-sided to oral margin (widened or flared apically in *Acridophagus*), and the indentation on the inner eye margin long (length of 8 or more ommatidia) (indentation in *Acridophagus* very small, length no more than 3–4 ommatidia).

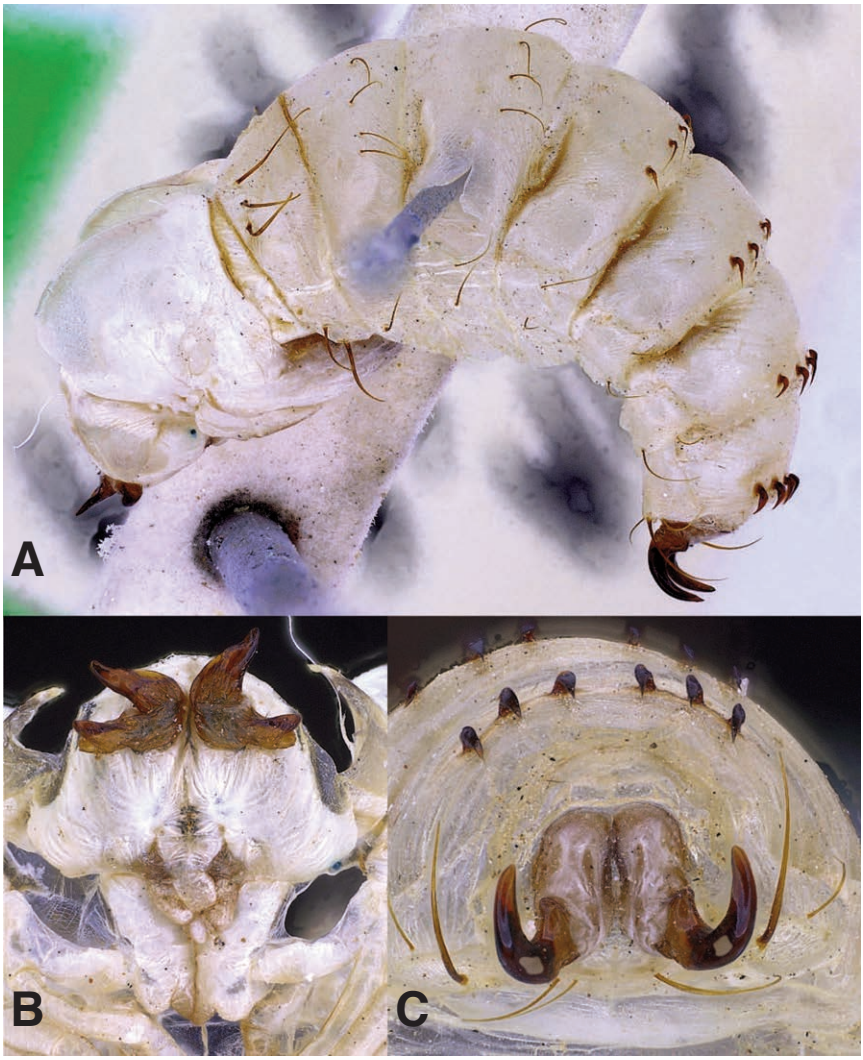
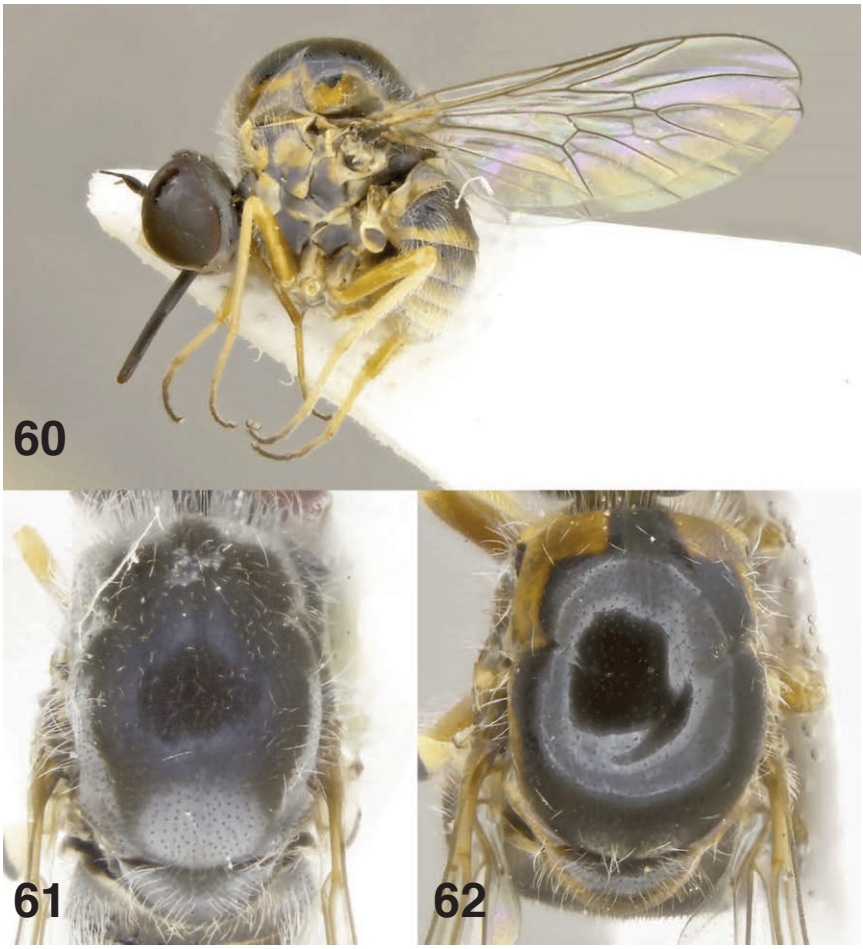


Figure 59. *Xymrod pilosa* Evenhuis, sp. nov., pupa. **A**. Lateral; **B**. Head, sowing cephalic armature; **C**. Last segment, caudal view.

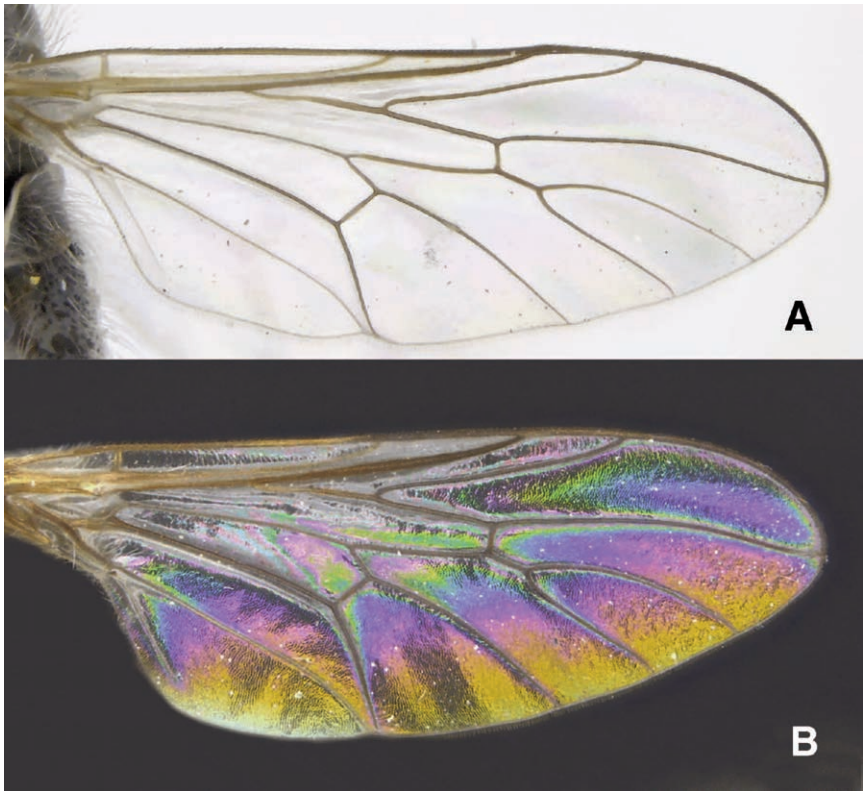


Figures 60–62. *Zzyzzarro hortorum* Evenhuis. **60**. Habitus, female. **61**. Male thorax, dorsal. **62**. Female thorax, dorsal.

Distribution. Australia (WA).

Etymology: The genus name is a fantasy dragon name, which means "The Gray One". Gender is neuter.

Included species. *Zzyzzarro hortorum* Evenhuis.



Figures 63. *Zzyzzarro hortorum* Evenhuis. **A**. Wing; **B**. Wing Interference Pattern.

Zzyzzarro hortorum Evenhuis
(Figs. 6, 8, 60–65, 71)

Zzyzzarro hortorum Evenhuis, 2022: 5. Evenhuis, 2024b: 22.

Types. *Holotype* ♂ and 7♂,8♀ *paratypes* from AUSTRALIA: **Western Australia**: Wandering, 32.4327°S, 116.4089°E, 3 Jan 2014, on *Astartea scoparia*, J. & F. Hort (WAMP). *Other paratypes*: AUSTRALIA: Western Australia: 11♂, same data except, 32.4290°S, 116.3982°E, swarming in Jarrah [*Eucalyptus marginata*] (WAMP); 2♂, Clare [Jarrahdale] State Forest, Armidale, 32.2311°S, 116.2996°E, 7 Jan 2017, J. & F. Hort (WAMP). Holotype in WAMP. Paratypes in WAMP and BPBM.

Description: Male (Fig. 6). Length: 2.8 mm; wing: 3.1 mm. *Head*. Length: 2.8 mm; wing: 3.1 mm. Head (Fig. 2). Black; eyes narrowly dichoptic, separated at vertex by slightly less than distance between lateral ocelli; indentation on inner eye margin (Fig. 8) long (= width of 7–8 ommatidia); vertex and occiput shining black, with blackish brown hairs directly behind ocellar tubercle; frons shining creamy white above antennae, with scattered short yellowish hairs; face slightly produced at tip of oral margin, creamy yellowish with white hairs; antenna black; scape minute, pedicel subcylindrical, slightly wider than long; first flagellomere lanceolate, length about 3.5× greatest width; second flagellomere long, cylindri-

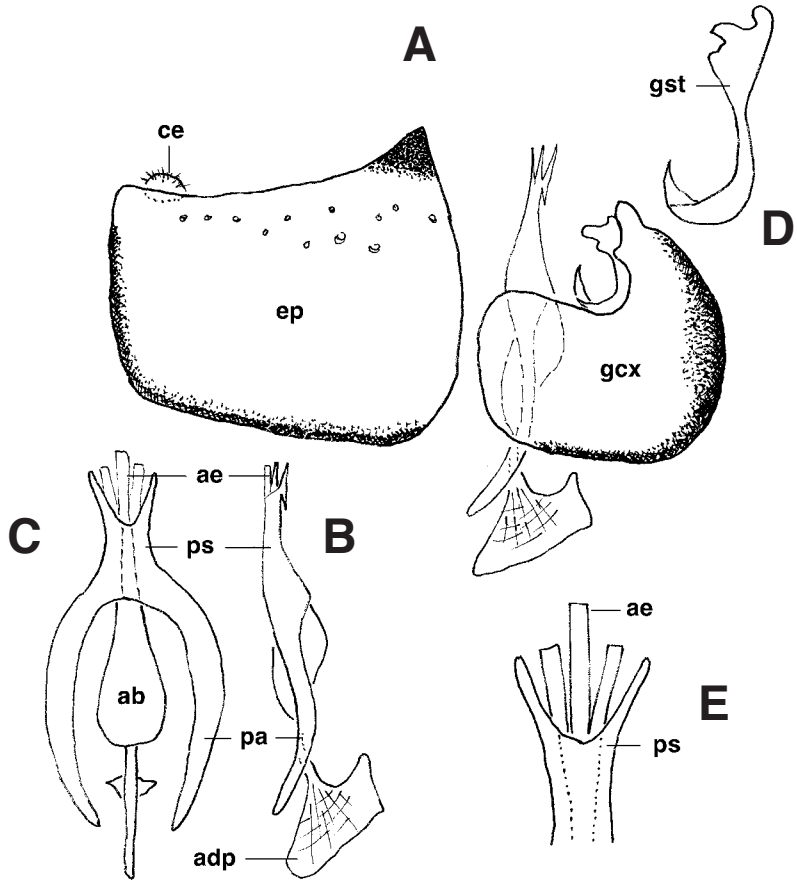


Figure 64. *Zzyzzarro hortorum* Evenhuis, male genitalia. **A**. Lateral view. **B**. Phallic complex, lateral view. **C**. Phallic complex, ventral view. **D**. Detail of gonostylus. **E**. Detail of parameral sheath apex showing trifid tip of aedeagus. Abbreviations: ab = aedeagal bulb; adp = aedeagal apodeme; ae = aedeagus; ce = cercus; ep = epandrium; gcx = gonocoxa; gst = gonostylus; pa = parameral apodeme; ps = parameral sheath.

cal, about equal in length to first flagellomere, with minute apical style; postgena gray pruinose with white hairs; proboscis black, length 1.5× head height; palpus not evident.

Thorax. Mesonotum strongly hunch-backed, matte black dorsally (Fig. 61), grayish pruinose anteriorly, laterally and on prescutellar area, with long whitish hairs; scutellum gray pruinose, dark brown posteriorly, brown stripe basomedially; pleura predominantly gray pruinose, otherwise all bare; meron black; halter stem yellow, knob yellow with dark brown dorsal spot.

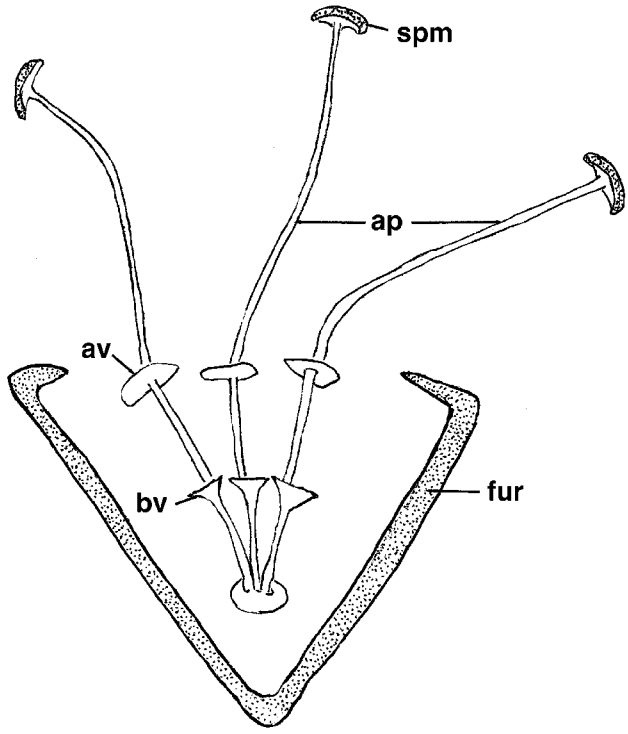
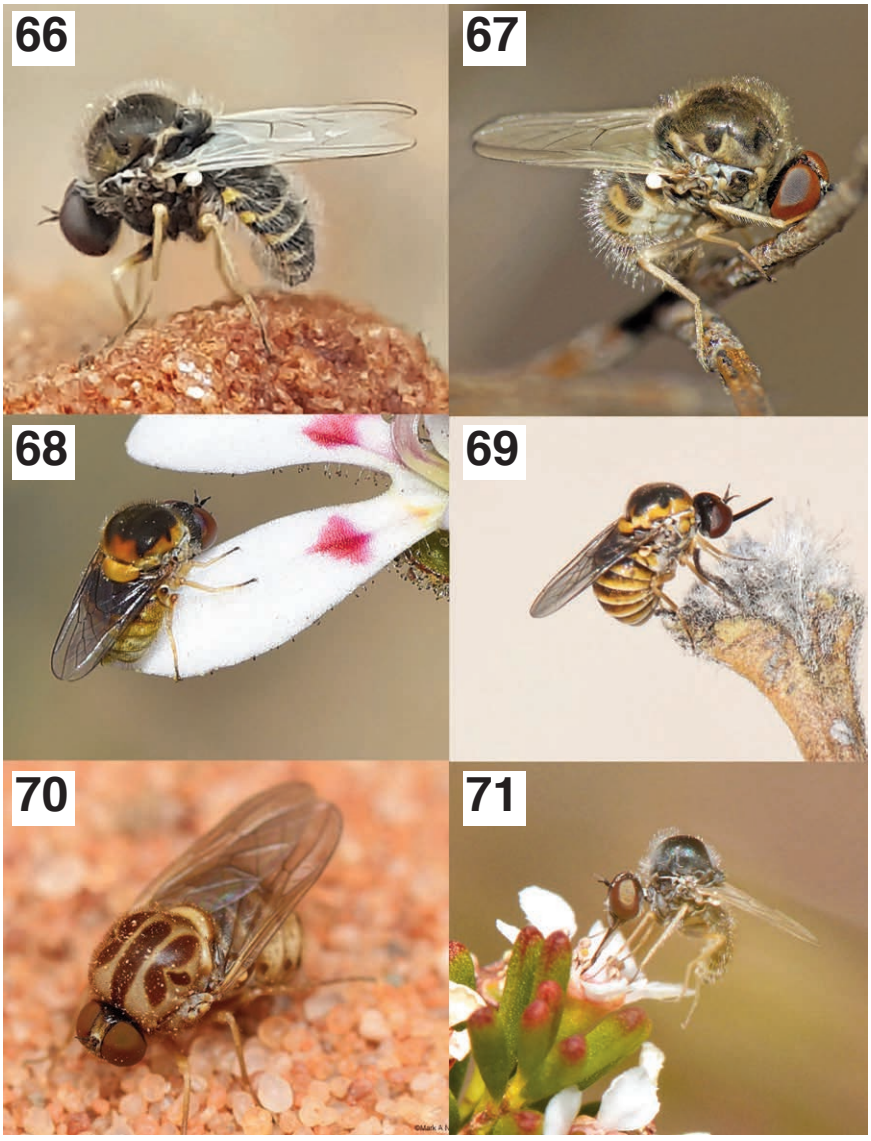


Figure 65. *Zyzzarro hortorum* Evenhuis, female genitalia. Abbreviations: ap = apical spermathecal duct; av= apical valve; bv = basal valve; fur = furca; spm = spermathecal reservoir.

Legs. Coxae black, with long white hairs; femora black basally, yellow on apical half; tibiae and basitarsi yellow, rest of tarsi black; femur and tibia with long with hairs with short yellowish white hairs. Pulvilli 3/4 length of claws.

Wing (Fig. 63). Hyaline; veins brown except Sc yellow; costa ends slightly beyond end of R_{4+5}; vein Sc ending in wing margin at level of origin of vein R_{2+3}; R_{2+3} shorter than last section of R_{4+5}, originating at midway point of Rs, ending in wing margin at level slightly beyond midpoint of R_{4+5}; Rs sclerotized at connection with R_1; R_{4+5} slightly sinuous at wing margin; r-m crossvein placed at apical 1/3 of vein M_{1+2}; vein M_1 and M_2 slightly curved to wing margin; cell dm open; anal cell very narrowly open at wing margin; CuP straight to wing margin, curved only at extreme apex; A1 not sclerotized; anal lobe normal; alula absent; fringe of short hairs on posterior margin of wing. WIP (Fig. 63B) with cyan to orangish and coppery coloration along posterior margin of wing; cell r2+3 magenta and greenish basally and anteriorly, dark bluish color apically and posteriorly; bluish at bases of cells r4+5, medial, CuP, and anal lobe.



Figures 66–71. Australian Psiloderoidinae, live habituses. **66**. *Acridophagus paganicus* (White), male. Photo: Nathan Butterworth. **67**. *Acridophagus paganicus* (White), female. Photo: Simon Grove. **68**. *Povno flaviscutellaris* (Roberts), female. Photo: Jean Hort. **69**. *Tolkunia* sp. 1. Photo: Jean Hort; **70**. *Xymrod* sp. Photo: Mark Newton; **71**. *Zzyzzarro hortorum* Evenhuis, male. Photo: Jean Hort.

Abdomen. Dorsum black with thin white along posterior margin of tergites, with long decumbent white hairs; tergite I membranous on medial 1/4; venter brown.

Genitalia (Fig. 64). Epandrium subquadrate, slightly wider than high in lateral view, with pointed posteroventral process, cerci extremely small; gonocoxa in lateral view broad, rounded ventrally; gonostylus hook-shaped with broadly rounded base, tapering sharply to thin long hooked apical process; phallic complex with aedeagus trifid apically, enclosed in parameral sheath with long thin parameral apodemes, extending almost to level of aedeagal apodeme; lateral aedeagal apodemes wanting; aedeagal apodeme relatively small, anvil-shaped, extending below gonocoxae.

Female. As for male except as follows. Frons as wide as width between lateral ocelli; mesonotum shining black, not as hunch-backed as male (Fig. 17), yellow to yellow-orange anteriorly and laterally, lacking pruinosity; yellow on postalar callus extending as line to posterior margin of scutellum; scutellum black medially; pleura black and yellow patterned (Fig. 62); abdomen lacking pruinosity; tergite I black with yellow spot laterally; tergite II black with large yellow color laterally; tergites III–V black with larger amounts of yellow laterally; tergites VI–VII all yellow; venter predominantly yellow. Genitalia (Fig. 65) Furca V-shaped, thin; spermathecal reservoirs thin, mushroom-shaped; apical spermathecal duct thin, as long as lateral arm of furca; sperm pump with disc-shaped apical valve and funnel-shaped basal valve, length of sperm pump one-half that of apical spermathecal duct; basal spermathecal ducts short than sperm pump; common basal duct absent [genitalia lost after dissection and illustration; other female specimens were unfortunately glued to points so as not to allow access for dissection of abdomens].

Etymology: The specific name honors the photographers and discoverers of this new genus and species, Jean and Fred Hort, and in thanks for their continued enthusiasm for the flower visiting habits of mythicomyiid flies in Australia.

Remarks. The live photograph of *Z. hortorum* (Fig. 71) shows the flower visiting habit of this fly at the type locality on blossoms of *Astartea scoparia*, an shrub endemic to Western Australia. Label data of specimens collected nearby show that males of this species swarm. Swarming behavior in mythicomyiids has only been recorded a few times in the literature but may be more common. The reason may be that such behavior can take place at dusk, long after optimal collecting has ceased and collectors have left the area. Mühlenberg (1971) recorded this type of crepuscular swarming behavior on an undescribed species of *Cephalodromia* Becker in Greece and I have observed males of *Mythicomyia rileyi* swarm at dusk in the Sierra Nevada foothills of the Central Valley in California. Lekking by gathering in flower heads is another form of "swarming" in micro bee flies and is common in species of *Tolkunia* (*vide supra*).

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